

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

80
13

BETTER FRUIT

The Pioneer Horticultural Journal of the Pacific Northwest

16
12

JUNE, 1922

Features In This Issue:

Shipment of Green Prunes
Pollination of Filbert Varieties
Benefits from Organic Fertilizers
Suggestions on Orchard Irrigation
Pear and Apple Blight in Montana
Care of Raspberries and Evergreens

Barnett C. R. Aerie bids.
Comp

20 Cents

The Single Copy

An abundant promise of fruit for
Yakima, Washington grower



Boxes of apples being unloaded by means of our gravity roller conveyor to be sorted and re-packed for shipment.



Spiral chute delivering boxes on a gravity roller conveyor to shipping department for storage or transportation.

Standard Indoor Transportation Systems

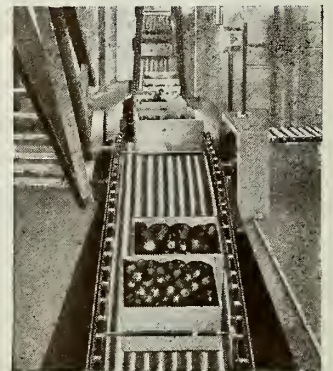
eliminate at least fifty per cent of the lifting, carrying or trucking of fruit in a modern apple packing or canning plant.

Our representative in your district will be glad to confer with you and show you how effectively a flexible Standard Conveying System can fit into your own specific handling conditions.

Write to our home office or to our representative in your district and get started the GRAVITY WAY. Act promptly so that you will be certain of securing the wonderful benefits of a Standard System for the summer and fall packing season.



Portion of Standard System installed in the packing plant of the Peshastin Fruit Growers' Assn., Peshastin, Wash.



Part of the Standard Conveying System in the plant of the Apple Growers' Union, Cashmere, Wash.

STANDARD
CONVEYOR COMPANY
NORTH ST. PAUL, MINN.

D. E. FRYER & COMPANY

421 Rialto Bldg.
Butte, Mont.

701 Gasco Bldg.
Portland, Oregon

Paulson Building
Spokane, Wash.

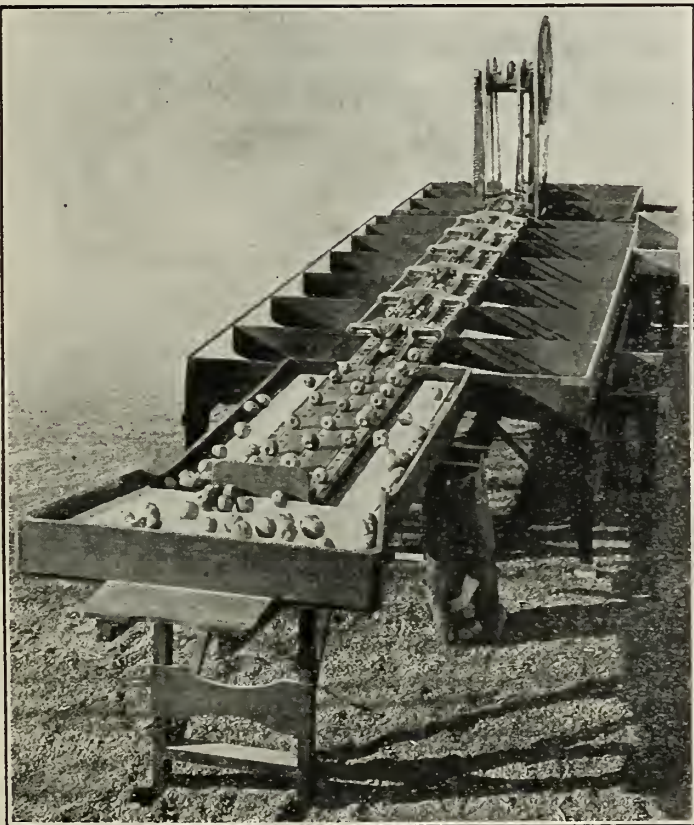
Lbr. Exch. Bldg.
Seattle, Wash.

We can't grow fruit —
No — it's not our business .

but our close association for the past fifty years with the successful Western fruit interests, as designers and manufacturers of their lithographed labels, cartons, containers, posters and all other forms of display advertising has clearly proven that **WE DO KNOW HOW TO MARKET FRUIT.**



SCHMIDT LITHOGRAPH CO.
Second & Bryant sts
SAN FRANCISCO



This is the
IDEAL FRUIT GRADER

THAT WAS ON DEMONSTRATION AT THE FRUIT EXPOSITION LAST NOVEMBER WHICH

was admired by everyone for the following features: Absolutely no bruising of the fruit. The most simple in construction. Nothing to get out of order. Noisless in operation. No springs or weights to adjust. Cost one-half of other makes. Workmanship of the very best. We can supply you in two, three or four grades machines to suit your needs.

We will be pleased to mail you our circulars and prices of the several different size machines we build. Also the name of the nearest agent to your place so you can see for yourself.

Do not wait until too late to get your order in like many did last season.

In writing mention the amount you will be packing so we can advise what size machine to use.

IDEAL FRUIT AND NURSERY CO.

GUIGNARD & SONS
Props.

HOOD RIVER,
Oregon, U. S. A.

The 1922 Cutler FRUIT GRADERS

We have secured the exclusive manufacturing and sales rights to the Pogue combination lidding and stamping press.

The Cutler Manufacturing Company has seen a greater advance for 1922 than in any year since its organization. The 1922 graders are the most complete and reliable line of packing house machinery in the market.

Among a score of improvements is our new spring scale which has proven far more accurate than the old type of scale. It is quickly adjustable and has a numbered indicator which makes the adjustments visible and definite.

Other new features are a two piece carrier-cup, a friction drive pulley, an automatic takeup for the carrier and many others.

Cutler Manufacturing Co.

Portland

Oregon

Cutler Manufacturing Company,
Portland, Oregon
Gentlemen:

Kindly forward me your 1922 catalog, and other material regarding Cutler Grader.

My 1922 crop will run approximately

Name

Address

BETTER FRUIT

The Pioneer Horticultural Journal of the Pacific Northwest

Entered as second-class matter April 22, 1918, at the Postoffice at Portland, Oregon, under act of Congress of March 3, 1879

VOL. XVI

PORTLAND, OREGON, JUNE, 1922

NUMBER 12

Suggestions on Orchard Irrigation

METHODS by which irrigation water should be applied to orchard lands vary considerably under the influence of the systems of cropping, slope and physical characteristics of the land. Shallow furrows, deep furrows and borders are well suited for moderately sloping land while deep contour furrows, flooding through thick stands of alfalfa or clover and in extreme cases, sprinklers should be used on steep land.

Since the shallow furrow method of applying water is in common use it requires no explanation. It is at present used practically on all types of soil and slopes of land. The practice, however, can be abandoned to advantage in some instances for better methods.

Shallow furrows are necessary for the most efficient distribution of water in row crops, for irrigating coarse, sandy soils under clean cultivation, and for moistening the surface of land sown to clover and similar crops. In coarse soil the spread and rise of moisture is not extensive. This renders it necessary to apply the water near the surface by means of shallow furrows placed close together to insure even and thorough distribution of the moisture in the soil.

Under such conditions the water should be run for a much shorter time than on finer soils. If this is not done heavy losses result from deep percolation near the flumes. It is important to have the furrows short. For sandy land, 200 feet is a desirable length and 400 feet is the extreme limit. On heavy soils, in which loss of water by deep percolation does not take place readily, the furrows should be much longer.

USE OF DEEP FURROWS—Deep furrows, for a number of reasons, are preferable to shallow furrows for orchard use. They should be extensively employed for land under clean cultivation and for steep slopes. By using deep furrows in clean cultivated orchards, the irrigation water can be used without wetting a great amount of the surface of the soil. Cultivation can be practiced immediately following irrigation, thus filling the furrows and covering the wet soil, a practice which is necessary to

Methods of applying irrigation water to orchards have important bearing on results the grower in an irrigated section may obtain. All too frequently the orchardist lacks dependable information on the subject. In such cases he usually accepts the practices of his neighbors without particular thought to basic fundamentals. While superintendent of the Hood River Experiment Station, R. W. Allen made an excellent report on orchard irrigation practices. The article following is taken from this report. The suggestions and applications, though based on practices in Hood River Valley, apply in large measure to other irrigated fruit sections.

prevent baking. This can not be done where shallow furrows are used and the surface of the land becomes wet.

Deep furrows do not need to be as numerous as shallow ones, and the water can be permitted to run longer in them with desirable results on all but coarse soils. The length of time the water is permitted to run, however, should be very closely watched for it differs materially with the character and condition of the soil. Three to five deep furrows for each space will give satisfactory results in irrigating most orchards. The number can be varied from a maximum of five to a minimum of two or three when the organic content of the soil is increased and its physical condition improved, for under such conditions the water will be found to enter and spread rapidly through the soil. Furrows of this character can be made with an ordinary turning plow, with a single shovel plow, or with multiple shovel furrowing implements.

APPPLICATION of water by means of deep furrows is claimed by some authorities to cause deep rooting. Whether or not this result actually occurs it is evident that by using deep furrows on the

finer soils, they become well moistened and will meet the demands of deep or shallow rooted trees or other plants and establish conditions favorable for the growth of roots at considerable depth.

Serious objection to the use of deep furrows is frequently voiced on account of numerous roots being destroyed in making them. It is, or soon will be recognized that plowing is necessary in most all orchards where the practice of shallow cultivation has been followed. It is evident, therefore, that deeper cultivation will be introduced, under which conditions there can be no objections to the use of deep furrows for irrigating.

Numerous observations of plowing in orchards not previously given to deep cultivation have shown that many small and medium sized roots were destroyed. Where such orchards have been properly irrigated and otherwise cared for, however, no detrimental influences appear to have resulted. It is not advised that deep plowing should be practiced the first year the plow is introduced in the orchards, but by gradually deepening the operation, a final state of cultivation that will permit of deep and effective irrigation can be accomplished without injury to the trees. When laid out on steep land in such manner as to modify the fall, furrows six to nine inches in depth will carry the water and render contour irrigation possible while it is not feasible with shallow furrows.

TIME TO IRRIGATE—To determine the time at which water should be applied a close study is necessary in order to know the approximate amount of moisture the soil contains. A superficial examination of the soil or an endeavor to judge from the appearance of the trees as to when they require water, does not convey a correct understanding of the conditions under which the trees are working. The first practice might result in the irrigation being applied prematurely, thus resulting in the waste of water and time. The second practice invariably results in a measure of drouth existing before the trees show signs of distress.

Ordinarily, irrigation should be applied before the soil begins to fall apart after be-

ing pressed firmly in the hand. Its falling apart indicates an insufficient quantity of water present to hold the soil particles together, which in turn indicates a scarcity nearly critical to plant growth. Since trees feed to a considerable depth, it is important to know that sufficient moisture is present at all times to the full depth of the roots.

FREQUENCY OF APPLICATION—The frequency with which water should be applied to a soil depends on the amount that it is capable of storing, the extent of loss by evaporation and the quantity used by the crop. When the capacity of the soil to retain the moisture is small, as it is in coarse shallow areas, the length of time it can maintain normal crop growth is proportionately less than for a soil having greater storage capacity. Orchards on coarse sandy soils require irrigation at intervals of ten to fifteen days during the active growing season. Those on silt and clay loams usually require two to four irrigations a year.

One irrigation applied in May or June might suffice on very retentive soils, but it is better practice to irrigate oftener and use less water at each irrigation. In this way a more uniform moisture content of the soil is maintained. Where orchards are found to require irrigation at intervals of two, four or six weeks, it is reasonable to expect that they would require irrigation at approximately half this period when two full crops are drawing from the supply. This point is often not fully appreciated by growers who place clover or alfalfa in their orchards.

AMOUNT OF WATER—The proper amount of water to apply depends upon the capacity of the soil to absorb and retain it. It is advisable to apply as much at each irrigation as the soil, to the depth from which the crops are capable of feeding will hold without loss of drainage. This quantity varies from approximately three inches in depth of water on sandy soil to eight or more inches for silt or clay. The capacity of any soil of any type is influenced by its depth. Therefore the amount of water to apply must be determined by experience for each tract of land. To apply less water than the soil is capable of holding unless near the close of the season, is inadvisable. By so doing more frequent irrigation becomes necessary with a consequent increase in labor cost and loss of moisture by evaporation. On the other hand care should be taken to avoid over-irrigation.

Experiments carried on by the irrigation investigations of the U. S. Department of Agriculture in a Southern California citrus orchard, irrigated with furrows 660 feet long, shows that at the upper end of the furrows the water had percolated down to a depth of 27 feet, while for the lower half of the furrows the depth of percolation was only about 4 feet.

Irrigation investigations in Idaho showed

that where the length of run was 2359 feet, it required an average depth of flooding of 1.6 feet for a satisfactory irrigation, while with runs of 237 feet the average depth of water for a thorough irrigation was only 0.7 feet, or a saving of 56 per cent.

It is probably safe to assume that the loss due to deep percolation will average no less than 25 per cent of the water delivered to the farm.

To decrease the loss by deep percolation, a remedy is to divide the field or orchard into short runs, the length depending upon the character of the soil, and to run the water more quickly in the furrows or over the field by using larger heads, especially for porous soils. This will usually require the practice of rotation at least for the smaller farms or orchards, which has the added advantage of decreasing the conveyance losses and of shortening the length of time involved in applying the water.

Little need be said of the harmful effects of over-irrigation. Such a practice results in waste of water, leaching, loss of soil fertility, water-logging low lands and smothering out vegetation. It also causes a very undesirable physical condition of the soil. Over-irrigation can be largely avoided by careful management.

Oregon walnut growers are seeking to have congress make an appropriation of \$2,500 to enable the Department of Agriculture to send an expert to study walnut growing in China and Manchuria. It is said that 7,000,000 pounds of nuts were imported through San Francisco, from those countries last year.

Cherry Experiments

THE most extensive and important cherry pollination tests probably ever undertaken have been under way the past few weeks in Wasco County orchards around The Dalles.

Under the direction of C. E. Schuster of Oregon Agricultural college the stamens of 450,000 cherry blossoms were removed and the blossoms covered with paper bags, as the first step in the experiment. All of these blossoms are on trees of the Royal Anne, Lambert and Bing varieties, which are both sterile and intersterile.

Pollen from all other known varieties of sweet cherries, some sour cherries and a few seedlings, was gathered by a corps of women assistants for use in artificially impregnating the emasculated blossoms. Each was covered with the paper bag, following this operation, and is allowed to remain that way until the fruit sets when it will be possible to determine the percentage of fertility of each of the pollenizing varieties, upon the sterile varieties. By these records it is hoped definitely to settle the question of the proper kinds of pollenizing trees to plant in orchards of Bing, Royal Anne or Lambert cherries.

It is reported that the acreage of vegetables planted this season by members of the Eugene Fruit Growers' Association is 332, as compared with 100 acres last year.

An experimental apple orchard of six acres is being set out by the Washington State College near Prosser, Wash.



Arrangements for trellising in this raspberry yard are good enough but the owner has neglected approved practices in not cutting out the old canes in the fall and cutting back the new ones.

Care of Raspberries and Evergreens

By J. L. STAHL

Horticulturist Western Washington Experiment Station, Mt. Vernon

THE CUTHBERT raspberry will usually produce three tons to the acre when the berries are grown most intensively. The Cuthbert has the best flavor of the four varieties commonly grown, and is the one berry the canneries call for more than the Antwerp, King, or Marlborough. The newer plantations being made in and around Puyallup and Sumner are of the Cuthbert variety.

I have picked out typical soils in that valley on which berries are commonly grown. One that is commonly called the Cuthbert soil is a light sandy loam. The heaviest soil we have in that valley on which we grow some of our other berries, particularly the Evergreen blackberry, is the heavy clay. Some of the Evergreens are also grown on the muck soil because we have a great deal of muck soil and the raspberry doesn't do so well on that soil as does the Evergreen.

In our system of growing berries the plantation is laid off in rows seven feet apart. That is our common distance used for planting the berry in Puyallup valley. The red raspberries are set 30 inches apart in the row, that requires about 2800 plants to the acre. We run out a furrow and set the plants in that furrow at a six-inch depth so that the root system is in the ground four to six inches deep. We cut off the cane so it is only one or one and a half feet high above the crown of the plant. Setting the plant is very important. Be sure that the dirt is well firmed around the crown and roots of the plant.

The first season the plants are grown without a trellis, cultivation starting as soon as they are set out. Usually they grow about three to four feet tall, and we will have three to five canes about that height by the end of the first growing season.

After setting the plants we continue cultivation about once in three weeks until about the first or the middle of May, and then we cultivate once in two weeks or ten days during the growing season. About August 1, we stop cultivation, then in the fall we plow towards the rows. This is chiefly for drainage purposes. The fine soil that is thrown toward the plant or hills keeps down weeds between plants and hills and the dead furrow in the center serves to carry off surface water from our heavy rains. This fall plowing is usually done about November. In the spring we plow away from the plants in February or early March.

We thin out the young shoots when we have six or eight shoots about 18 inches high. We retain the remaining one for our next year's crop and keep out the later canes that develop. In a three or four-year-old plantation we often have 12 or 13

While there is no great disparity in methods of planting and caring for the cane berry crops it is of interest to even the smaller isolated growers to know the practices employed in the finest berry districts. Professor Stahl here explicitly outlines the most successful methods of planting and caring for red raspberries and Evergreen blackberries in the famous Puyallup-Sumner district in Washington. Points that are emphasized may be found greater factors for success than the average small grower imagines.

produced in one hill. We like to keep just the number we want to produce next year's crop, six to 10 new canes being the most we like to leave. Oftentimes we do leave two or three extra canes over and above the six to 10, then in case we have some injury we have from six to 10 which will bear a crop next year.

BEGINNING with the second year, we put up a trellis. We believe in the trellis system in berry growing, because it is easier for the picker.

We use four wires on cross-pieces—commonly two wires will do just as well where this plan is used—and we do not use cross-pieces if our posts are thick enough as when we use the 10-inch post. These posts are set two rods apart in the row.

If we have a six-inch post we put on a cross-piece, so we have our wires 14 to 15 inches apart for our trellis. Then we weave the plants on these two wires, number 14 wire for red raspberries. Put the wire about four to four and a half feet high. Our experience is if you put wires too high the berries will not be picked as readily.

In weaving, divide the hill, carrying half the canes on one side and half on the other. The canes are all pulled on the outside of the wire, carried up over the wire, down and on the near side, then tied with a string when we start weaving at the end of the row. After that, no tying up is necessary the entire length of the row. Usually take about three canes, carry them up over, down under and tie them; take three more, carry up over, down under and under the canes just ahead, very similar to the manner of weaving baskets.

Another plan is to weave on just one side, allowing the one wire merely to hold the canes in place. The objection to the single wire in weaving is that you are crowding your canes a little more than you will with the other plan. If you have plenty of wire,

the lower wires will aid in holding canes in place, but with double wire interweaving it is not necessary to use four wires.

There is another plan, just to carry the canes instead of weaving them to a wire and tying each individual cane with a string. That requires quite a lot of handwork, even more than the weaving. The most common method is that where weaving is practiced.

After the harvest season we cut out the old canes, allowing the new canes to stand between the wires until the following spring. We have the worst winter injury where we do not cut out the old canes until next spring. We train the vines in February, just before the buds start in the spring when the canes will bend without breaking. If we weave in the fall, the canes are more apt to break.

In the fall we cut out the old canes, about two feet above the ground, leaving the stub. Then in the spring we break that off clear down. If you try to cut out the old canes right after harvest you will have to leave a little stub because that cane is not entirely dry, then go through on your hands and knees next spring and break off that stub. Instead of that we like to leave the stub long enough so we can pull the cane without getting down on our hands and knees.

WE SET Evergreen blackberries about a yard apart in the rows with the rows seven feet apart. At Puyallup we are growing more Evergreen and that is the one berry that is there to stay. We secure yields of about six tons to the acre, often seven to the acre, so you see it is a paying crop.

We set the plants 16 to 18 feet apart. The new canes may be carried on a trellis about two feet in height in the summer, and the following spring, in February, carried up and put on a double wire trellis about four feet in height. The upper trellis on which the bearing canes are trained is made of number 12 wires. The trellis on which the new canes are trained can be made of number 14 wire.

We support the canes by means of cross-pieces. The cross-pieces for the bearing trellis are 20 to 22 inches in length, in the trellis for the Evergreen blackberries—for the young canes about 14 inches wide. If we have a narrow trellis, of 12 inches, we will have a great many of those side arms broken and the fruit will not mature. They will break down. If the trellis is wide, they will grow out laterally.

Some of the growers instead of training the new canes underneath, use eight foot posts for trellising, with two feet in the

(Continued on page 21)

Benefits From Organic Fertilizers

By MAJOR E. P. NEWSOM
Chemist and Lecturer on Soils

PLANTS and trees need a well balanced ration of food, just as animals do. A hog allowed to roam wild in the woods, feeding chiefly on roots, will run mostly to head, tail, bristle and bad temper.

The theory that we should analyze the soil and supply the particular plant food lacking has not worked out successfully in its application to our orchards and farm crops because an analysis of the soil may reveal the existence of an abundance of plant food, phosphate and potash, for instance, but in an unavailable form. We know that rock phosphate, however finely it may be pulverized, is not soluble in water.

Most of the potash in the soil is derived from granite, in which it occurs as a double silicate of aluminum and potassium and is absolutely insoluble in water. The same is true of calcium carbonate or limestone. In fact, were these elements soluble in water alone without the intervention of any other agency, they would leach down so deeply in the soil within the space of two years that then the ground would not sprout cowpeas.

In experiments of the Pennsylvania station, carried on for a period of thirty-five years, the greatest yields of crops were due to fertilizing with a well balanced fertilizer, containing not nitrogen alone, but also soluble acid-phosphate and potash. It was found, that although the analysis revealed the soil to be unusually rich in phosphate and potash, whenever either the potash or phosphate, in soluble form, was omitted from the fertilizer the yield of crops was greatly lessened.

The chief agency in rendering plant food in the soil available is CO₂, or carbon dioxide. This is generated through bacterial action in the process of the decay of vegetable or animal matter in the soil. It is also derived from the atmosphere and finds its way into the soil by means of the rain which carries it in solution. But the bacterial action is slow and does not supply, even with the aid of alfalfa or other cover crop, the needed carbon dioxide fast enough to prevent the "skip" crop every other year.

Some people make the mistake of concluding that nitrogen is the only thing needed in a fertilizer. This conclusion is equally as erroneous as the first one. In increasing the leafage the first year through resort to nitrogen-producing bacteria there is the chance that there may remain a slight overplus of availability of other plant food, due to bacterial action. But when you continue the process over any measurable period of time you lay too heavy a burden on the backs of the bacteria, and the poor bacteria will feel greatly grieved, I am

Since Major Newsom submitted this article has come the entirely unexpected news of his death in Spokane, Wash., on May 12, at the age of 55 years. His writings in BETTER FRUIT have, we believe, carried real educational value. He was a true friend of the fruit industry and gave to it of his talents. Prior to his connection with the Marine Products Company of Tacoma, as chemist and lecturer, he had served many years in the United States army as a chaplain and officer. He participated in two campaigns in the Philippine Islands. He was buried with military honors at the Presidio, on May 16.

sure, and their dispositions will be well nigh ruined, to think so much was expected of them!

The Encyclopedia Britannica states that at Rothamsted Station, England, organic fertilizers were used for a period of fifty-one years, resulting in the average yield of wheat of 37 bushels per acre as compared with an average yield for the same period of only 13 bushels on the same kind of soil unfertilized. The same results were obtained at Woburn, England, for a period of 31 years.

As a further fact it is stated that the good effects of organic fertilizers on the soil could be seen for fifteen years after their use was discontinued. On the other hand, in Pennsylvania, where the strictly chemical, or inorganic, fertilizers were used for several years, it was seen that when their use was discontinued, the soil was found to be dead. In other words, that it would not respond with a yield of crops without the fertilizer. Dead soil is simply soil where the bacterial life has been destroyed.

Chemical, or inorganic, fertilizers, while at times useful as a tonic for "sick" trees, tend to destroy the bacterial life of the soil by their residual effects. Their use is advocated on the ground of cheapness and the "quick kick" they have. So also morphine and cocaine have a "quick kick" and for a few minutes the victim imagines he is a millionaire and that in comparison to himself John D. Rockefeller is a hump-backed mendicant, but the drug soon kicks the victim into inefficiency and degradation and makes of him a parasite and an unproductive citizen.

So also some of our orchardists who are

continually experimenting with soil drugs will find their orchards "kicked" to much less than their normal productivity. It does not change the final results for someone to say that for several years, by the grace of an abundance of rain or water to wash the after effects out of the soil, he got good results. Many a man or woman has kept his or her back from aching by the use of morphine for several years.

Now organic, or animal products may cost a little more initially, but are more economical in the end, because not being water soluble, but breaking down under moisture conditions gradually, through bacterial action, are more lasting, while not leaving in the soil hurtful residual effects. They not only furnish available plant food to the tree, but immensely stimulate and invigorate the bacterial life of the soil and thus very much increase the production of carbon dioxide. The latter in turn is the potent and necessary agent by which other plant food in the soil is rendered available. The organic fertilizers render a double benefit.

If any further proof were needed to substantiate these statements, I would invite your attention to the very remarkable discoveries made in Germany during the past few years relative to the great importance of artificially fertilizing with carbon dioxide. I hope you have been fortunate enough to have read an article contained in the *Saturday Evening Post*, of last October 1st, entitled "Raising Bumper Crops in Germany with Poison Gas."

BRIEFLY, in 1917, German scientists undertook experiments in fertilizing artificially with CO₂. The results were most encouraging. But it remained for Friedrich Riedel, a German engineer, to carry out the experiments on a large scale under the most favorable conditions.

At the great smelting works of Stinnes, in Luxemborg, he laid perforated concrete pipes, fifty centimeters in diameter, into fields through which filtered and purified carbon dioxide was forced by electric fans, the fields being planted to various crops. Nearby, he erected glass covered enclosures, through which carbon dioxide was sent through perforated tubes above ground furnishing 5 per cent of carbon dioxide. The results, of course, were greatest in the glass covered enclosures, since in the open fields much of the carbon dioxide was blown away by the winds.

The first and most important result from the artificial use of the carbon dioxide was the greatly increased leaf growth. The leaves of Riedel's gassed plants were larger and their stalks thicker and firmer. In some cases the leaf area was increased by

(Continued on page 25)

Pollination of Filbert Varieties

By C. E. SCHUSTER.

Oregon Agricultural College, Corvallis

IN DISCUSSING the question of pollination, we will take the term pollination merely to mean the operation which the pollen grain is placed on the pistil of the female flower. Fertilization is the union of the male and female gametes.

In considering the pollination of the filbert, we find more different difficulties than are connected with any other nut or fruit commercially grown in the Pacific Northwest. In addition to being one of the group that depends on the wind for pollination, the filbert blooms during that part of the year which is not usually considered ideal blooming time. The filbert ordinarily blooms during the rainy season, or the period during which rains are more or less common.

Insects are not essential for cross-pollination as with other fruits. The pollen being borne in separate flowers, is carried to the pistillate flowers by the wind. Being of a nature that rapidly absorbs water, the pollen grain cannot be disseminated except during those periods or times of the day when the moisture is least prevalent. Wet pollen cannot be blown or scattered about by the wind.

The catkins are formed during the late summer and held on the tree until January and February, when the pollen is shed. Each catkin contains, on the average, about 150 bracts and in each of these we found about 8 anthers. Figuring that 1000 pollen grains are found to the average anther, we see that there is possibility of over a million pollen grains being produced by one catkin. It gives a great abundance of pollen, but this is necessary when we consider the possibility of the floating pollen grains lighting on the small individual pistillate flowers.

The pistillate flowers are contained in separate buds and are not evident until considerably later than the first catkin appear. With the earliest varieties we find the first appearance of the pistillate flowers to be around the end of November or the first of December, while some varieties do not appear for some weeks after that. Although the earlier varieties show the pistils the first part of December, the full growth is usually not made until the latter part of January and February. In each bud we find from nine to ten pistils, or separate female flowers. From each of these there is a possibility of developing a single filbert so that we find large clusters of nuts where the pistils have been well pollinated.

After a pollen grain is placed on a pistil it begins to germinate almost immediately and makes a growth down into the tissue of the pistil. After growing a short distance into the pistil the nucleus encysts and remains in this state for from four to five

Filbert culture is a comparatively new branch of nut growing in this country. Little has been written on the subject and there is much yet to be learned. Professor Schuster made a distinct and valuable contribution to existing funds of information about the filbert in studies of its pollination habits pursued last year. His discoveries, as reported to the annual convention of nut growers, may seem a bit technical. They are quite understandable, as a matter of fact, and point out methods of planting that seem of vital importance to everyone who undertakes filbert growing in the Pacific Northwest.

months. At the end of this period the growth is continued and the fertilization takes place.

From now on we will make no further mention of this question of fertilization. This then gives us a condition where pollination occurs on an immature pistil or undeveloped female organ and the male gamete, or nucleus of the pollen grain, is forced to wait for the development of the female part or gamete.

Usually the pistillate flowers of the main varieties are out and fully developed before the catkins begin shedding the pollen. But, since it is well known that the different varieties produce pollen at different periods, we often have the condition of pollen from a variety falling upon the pistil of another variety before the pistils have developed their full growth. The exact state of receptivity of the pistil

is not known, but on February 3, 1921, a number of blossoms were hand-pollinated. At this stage the pistils were a little more than through the bud scales and it was two weeks before they were considered fully developed and in fine condition to receive the pollen.

SEVERAL varieties were used for cross-pollination at this time. With the varieties that gave good results when used for cross-pollination at the later time, at which the pistils were fully developed, practically the same results were obtained with early pollination. In other words, the pistils were receptive shortly after making their appearance, and will not reject the pollen before they reach a state of maturity.

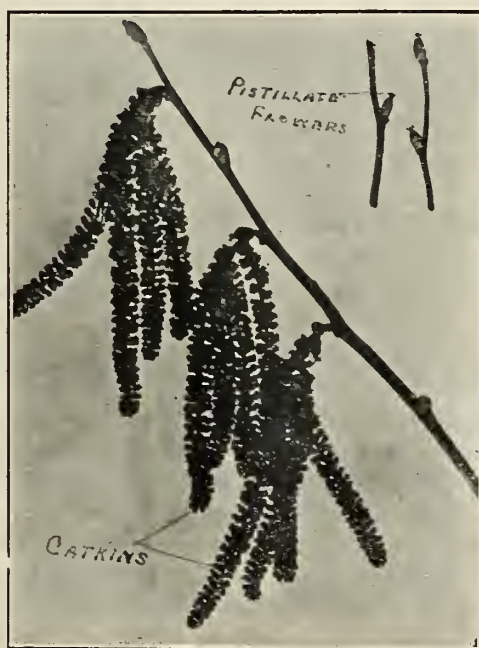
With the blossoming season coming during January and February what insurance have we against rainy weather at this time? Pollen being light and blown about by the wind, it stands to reason that rain is detrimental to its distribution. So means of circumventing these rains must be considered.

In the first place, the blooming season of the catkins, or male flowers, is long, considering other fruits. Not all the pollen is mature at one time. The development of the catkin is progressive from the upper end to the lower part and is rapidly increased by warm temperature. With the progressive development and cool temperature at this time of the year, the shedding of the pollen is thus spread over a relatively long period.

Pollen is viable over considerable periods. As it is first shed it gives a high test of germination, decreasing at a rate of about one per cent per day for the first fifteen days and decreasing more rapidly after this, so that by the end of thirty days it is down to about 25 per cent viability. Thus, the catkins may mature and hold the pollen for some considerable time without any material damage to the pollen.

As the pollen is matured the anthers containing the pollen are split open, allowing the pollen to escape. If the time of maturity comes during a period of high humidity the walls of the catkins absorb so much moisture that it forces the sections together so opening cannot take place until the anther is partially dried out. If the anther should open and the catkin be moistened this same process or condition forces the halves of the anther together so the washing of the pollen from the catkin is partially prevented and the anther is able to hold the pollen until favorable weather conditions are at hand.

Tests at the experiment station show that the pollen is very resistant to atmo-



Catkins and Pistillate flowers of filbert at blooming time.

spheric and climatic changes. Immersion in a film of water will cause pollen to germinate somewhat and we may consider moisture the worst enemy of pollen that we have.

Germination or growth of a pollen grain occurs within a short time after immersion in a suitable liquid. It has been found that 90 per cent of the pollen will be germinated in four hours at 65 to 70 degrees F. and a little less at 50 degrees. As light or darkness has but little effect on germination of the pollen, the main thing is to have a period of time long enough for the catkin to dry out and the pollen to be shed. Therefore, if there comes a period of comparatively dry weather followed by light rain, but not heavy rains, we may expect pollination to take place. The surface of the pistil is very rough and it would undoubtedly require a rather heavy rain to wash off the pollen.

Pollen grains are resistant to cold temperatures until they are subjected to the extreme temperatures such as those of December, 1919. Exposure to temperatures of zero for 96 hours only reduced the germinability or viability of the pollen about 12 per cent. From this we can deduce that frosty weather is of less moment than rainy weather. However, when we consider the season of 1921 and its excessive rainfall and then see the average crops of filberts that have been produced we are fairly sure of a good crop of filberts under any but the worst conditions.

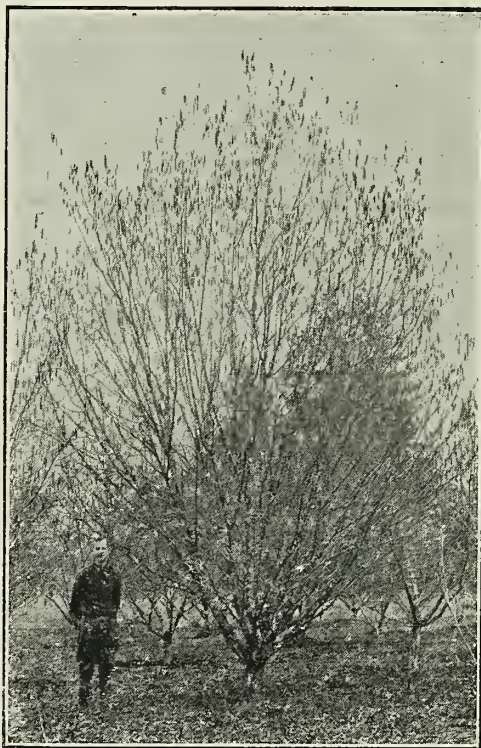
After considering the catkin and the pollen what of the pistillate flowers? The pollen may be washed off the pistils, but it is doubtful if any other extensive injury from rains can take place.

The pistillate flowers are more susceptible to low temperatures than is the pollen. Where pollen was little injured at zero in 96 hours, the pistillate flowers had 90 per cent of the stigmas or three-fourths to one-half of the pistil that is exposed killed. A temperature of 15 degrees killed 20 per cent in 12 hours and 25 per cent in 24 hours. Thus, it appears that the pistillate flowers are much more susceptible to low temperatures than the catkins. It would seem that it might be wise to avoid some of the worst frost pockets instead of advocating the planting of filberts anywhere west of the Cascade mountains, irrespective of air drainage. During the last ten years we have had temperatures below 15 degrees.

The main question, then, is one of pollination. In all of the literature available, little or nothing is said of pollination. E. A. Bunyard of England says, "No work has yet been done to test the self-sterility, or otherwise, of nuts, but judging from large orchards, one would assume that the commonly grown varieties are quite self fertile." Other references than this one amount to little, so it can be assumed that the pollination question is not a serious one, either from the fact that European growers generally have planted more than one

variety, or that the varieties there are really self-fertile.

TESTS carried on during the past two years have not shown any variety of filberts that was self-fertile. On the Barcelona this past year 306 pistillate flowers were sacked and allowed to self-pollinate. Two nuts resulted; 112 Daviana flowers were selfed with no nuts resulting. Seventy-two Duchilly were selfed with the same results. One-thousand and seventy-three pistillate flowers of thirty-one separate varieties, in addition to those mentioned, were also selfed and twelve fruits resulted or about one per cent of the blossoms set fruit.



Giant Daviana filbert, 16 years old, 23 feet tall and having spread of 20 feet. (Cuts by courtesy Oregon Grower.)

To check the percentage of fruits borne from self-pollination, counts were made of blossoms that were wind pollinated. These were made in different orchards and on different varieties. In one orchard it was shown that 37 per cent of the blossoms set fruit. In another 57 per cent of the blossoms set fruit. This would indicate that the one per cent set from self pollinated blossoms would not form more than a small per cent of the crop.

Further work is necessary, but it would seem from last year's work that the filbert sets fruit on a very high percentage of its blossoms. One thing, then, that must be considered is the necessity for continually producing vigorous new wood, as this wood is most productive of both types of flowers.

Since all varieties are self-sterile it must then be a problem of cross-pollination. With other fruits we find that some varieties cross-pollinate to good advantage, while others are inter-sterile. This condition exists in the filbert. Taking the Barcelona we find that all of the common varieties

will cross-pollinate it to a certain extent; some more, some less. There are some lesser known varieties such as the Fertile de Coutard that are entirely inter-sterile.

One of the best pollinators is the Cosford, a variety little known. This resembles the Daviana. The Du Chilly has uniformly given good results and, due to the fact that it is a good commercial variety, is undoubtedly one of the best for this purpose. The one drawback comes from the fact that it blooms considerably later than the Barcelona.

With the Du Chilly, the varieties that have been recommended by the different growers all work fairly well. Again the best results for last year were with little-known varieties. Further tests are necessary to show whether or not they are enough superior to warrant attempting to propagate them to any extent. None of them that gave the best results on the Barcelona or Du Chilly are heavy enough bearers to be really commercial varieties.

This brings us to the question of inter-planting. Before taking that up we must consider how far the pollen will be carried and also the proportion of pollenizers to plant.

Some trees were stripped of their catkins and left to wind pollinate. Those over 100 feet distant bore less than one per cent nuts. Although light, the pollen evidently does not carry very far. In observations in the field it seemed that trees plant 40 to 60 feet from a pollenizer bear good crops, though the ones at 60 feet sometimes appear light. From evidences at hand it would seem that the trees should be more than two trees distant, from the pollenizers, that is when planted 20 to 25 feet apart. This can be accomplished in one way by planting in every third tree in every third row; one pollenizer to 8 of the regular variety. Thus this would give eight Barcelonas and one Du Chilly.

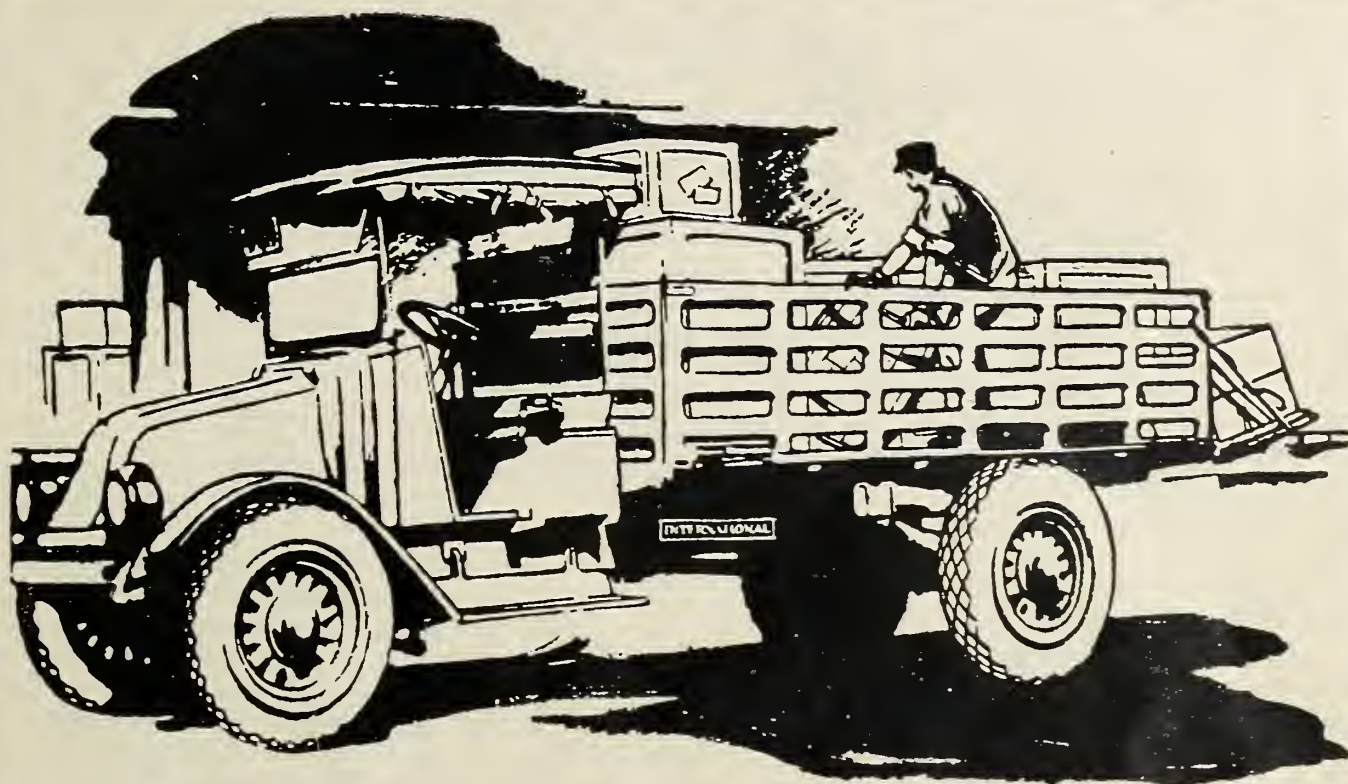
In seasons when the blooming time of Barcelona and Du Chilly are wide apart it is doubtful if the Barcelona receives full benefit of the pollenizing ability of the Du Chilly. An examination of the pistillate flowers last season showed that the stigmas of many Barcelona flowers had a dead, washed-out appearance before the Du Chilly was ready to shed pollen. Under these conditions it would seem advisable to have an earlier pollenizer.

The earlier blossoms would be taken care of by the early blooming variety while the later blooms would be pollenized by the Du Chilly. This would give vigorous, viable pollen for both early and late blossoms. The last pollen of the season is less viable than the earlier pollen. The question of blank nuts is a large problem some years and is unquestionably connected with some phase of pollination. A pollenizer that would come between the Du Chilly and Barcelona and pollenize both would give almost ideal conditions. There are several varieties that are good for one of the varieties and fair on the other.

THIS system of double pollenizing brings up another problem, that of arrangement. From previous evidence it would seem to be possible to plant three solid rows of Barcelonas, as this arrangement would put the trees not over two rows

from the pollenizer. Alternating with this could be a row composed of one late pollenizer, one early pollenizer and a Barcelona, thus giving 84 per cent Barcelona and 16 per cent pollenizer. This extra number of trees for pollenizing purposes reduces

the number of Barcelona trees, but the writer believes the benefit received from additional pollination will offset this. The main idea of the double pollenizer is to furnish an abundance of pollen during the
(Continued on page 22)



From Orchard to Market with International Motor Trucks

THROUGHOUT the growing and marketing season there are countless jobs that can be done quickly and to the best advantage with an International Motor Truck. It speeds up spraying, pruning, and cultivating by hauling tools and materials, and saves the time of several men in picking season by its greater capacity and speed in hauling the fruit to the central station. When the fruit is ready for market the International again comes into service and transports the crop to the shipping point safely, without delay or interruption.

Years of experience in building machines and tools for orchard and farm use stand back of the present highly-developed line of International Motor Trucks. All chassis parts are well-designed and built with a reserve to withstand the extra strains. The engine is powerful and accessible.

There are styles and sizes for every orchard or farm — capacities range from the 1500-lb. Speed Truck to the 10,000-lb. heavy-duty model. Special bodies for fruit hauling are available on all chassis.

*For complete information see the nearest International
motor truck dealer, or write for our catalog.*

INTERNATIONAL HARVESTER COMPANY

CHICAGO

OF AMERICA
(INCORPORATED)

U S A

Branch Houses in 92 Principal Cities. Dealers and Service Stations Everywhere.

Pear and Apple Blight in Montana

By DEANE B. SWINGLE,

Botanist and Bacteriologist, Montana Agricultural Experiment Station, Bozeman

BACTERIAL blight of apples and pears was first seen in New York State about 1792 and since that time has spread over the entire United States, doing untold damage to pomaceous fruits. While the greatest destruction has been in the pear-growing valleys of California, the losses in apple orchards also have been very heavy. Certain parts of the Rocky Mountain region were the last to be invaded by this disease. It did not reach Montana until about 1905, when it made its appearance near Hamilton. The writer made strenuous efforts to get the disease stamped out, but received the support of only a few of the fruit growers, the others being unable to realize the seriousness of the situation. The State Board of Horticulture was not at that time organized to a point where it could handle the situation.

Apparently separate introductions of the disease were made, probably with nursery stock, into other parts of the state. At Miles City and at Laurel the blight had made such great headway before being reported that its eradication would have required much labor and expense, but at most other points it could have been eradicated at relatively small cost had the recommendations of the Experiment Station been carried out. In three instances the disease was so quickly brought under control that very little damage was done.

The spread of the blight through the apple orchards has been rapid, and thousands of fine, thrifty trees have been destroyed entirely. At the present time it may be found in every part of the state. This is, however, but a repetition of the experience of most other states throughout the country.

For a period of several years the State Board of Horticulture made a most determined fight against apple blight and succeeded in bringing it under partial control, largely by the wholesale elimination of very susceptible varieties such as the Transcendent crab. The disease now appears some years as an extensive twig blight, killing a few large limbs and trees, and some years as a very light and scattered infection, doing but little damage.

CAUSE AND SYMPTOMS OF BLIGHT—This blight is caused by a bacterial organism, a parasite quite unlike insects and fungi. It attacks principally the apple, pear, and quince. A very light infection that soon dies out may occasionally be found on stone fruits, and on service berry, hawthorn, and some other pomaceous shrubs. It never attacks willows, poplars, and other wild plants that are not related to the apple.

The blight germs gain entrance to the trees in several ways: (1) Through wounds

Bacterial blight in pear and apple trees, a disease difficult to control in the better organized fruit districts, has been even more troublesome in sections where orchardists are neglectful of approved practices. The article that follows carefully presents both the causes and the remedies. It should provide the incentive necessary to stir the owner of every orchard where blight makes it appearance to adopt the drastic measures by which it may be eradicated. Those contemplating new plantings will find here a helpful guide in the matter of susceptibility of varieties to the blight.

made by pruning tools, cultivators, etc.; (2) through bites of insects, particularly the green aphid; (3) through the open flower, to which it is carried by bees, ants, and other insects, and, as has recently been shown, by the wind. When once the germ gains entrance it multiplies rapidly and works downward through the bark, but may not cause any visible effect until weeks after the infection has taken place, so that the grower is badly deceived as to just when the disease was acquired.

The following symptoms are very characteristic: If the infection begins in a flower cluster or in the end of a shoot, as it usually does, the leaves first wilt and droop, then turn brown in the apple and nearly black in the pear. Soon they become dry, hard, and brittle. The bark of the affected twig likewise becomes slightly darkened in the apple and nearly black in the pear. The line between the diseased and the healthy bark is not sharp and distinct during the growing season, so that it is often difficult to determine just how far the disease has progressed; and it is usually farther than an inexperienced person would suppose. On cutting into the diseased bark one finds the inside at first pinkish in color instead of a healthy green, but when it has been diseased for a few weeks it becomes darkened through to the wood, which remains nearly white and normal. This is essentially a bark disease and will continue, in susceptible varieties, to run down the limbs and trunk into the roots, sometimes killing the tree outright in a single season. It practically ceases to spread downward at the end of the growing season and becomes dormant during the winter, but with the opening of spring activity is renewed and another stretch of bark is killed. This continues until the tree is completely overcome. Sometimes the attack begins in the water-sprouts at

the base of the tree. Under these circumstances it reaches the roots in a few weeks, where it can not well be treated, and the case becomes practically hopeless.

There is a general impression that plants or animals that are very vigorous resist disease better than those that are generally unhealthy and stunted. This certainly is not the case with apple and pear blight. In slow-growing trees the disease makes but moderate progress downward through the bark and generally dies out without reaching the larger limbs, while in very rapidly growing, vigorous trees it progresses rapidly, sometimes running through the bark from the tips to the roots in a single season.

OFTEN there may be seen on the blighted leaves and branches, and especially on the blighted fruits, a yellow exudate in tiny droplets, or even in larger quantities running down the tree. This contains enormous numbers of the germs of the disease and is freely visited and eaten by ants, wasps, bees and probably other insects, that carry it to other trees, especially to the flowers, where a fresh attack begins. A single bee may thus infect several hundred flowers during the season, and a swarm of bees could infect many thousands. This accounts in most cases for the very extensive and sudden attacks that many orchards have suffered.

When the healthy leaves have fallen in the autumn, those on the diseased twigs and branches still cling to the tree, where they are very conspicuous. At this time also the diseased bark has turned quite dark, especially in the pear, and the line between it and the healthy bark is more sharp and distinct than during the summer season. Here, in the deeper layers of the bark, in the line between the diseased and the sound tissues, the bacteria that cause the blight live over winter. On the assumption that they do not live over in the ground or anywhere else excepting the region just indicated, the following treatment is advocated by the United States Department of Agriculture and by many of the experiment stations, and is extensively practiced by orchardists with some measure of success.

TREATMENT OF THE BLIGHT—In a single sentence we can say that the only known method of curing a blighted tree is to cut out and burn all affected parts. This seems simple enough, but there are important details that determine between success and failure. As a matter of fact, very few inexperienced men are successful, largely because they will not pay close enough attention to these important details. The following rules should therefore be thoroughly mastered and rigorously followed:

See that no blight is allowed to winter over in the trees. The best time of the year to cut it out is late fall or early winter.

In the dormant season the blighted branch should be cut off about a foot below any visible portion of the disease; in the summer, two or three feet below. If this necessitates cutting off a larger limb, this should be done. It is this rule that is transgressed most often and with the most serious consequences.

After each cut the saw or shears must be disinfected. The disinfectant can best be carried in a milk bottle attached to the belt, and can be applied with a swab. Small corrosive sublimate tablets (four to a pint of water) make an excellent disinfectant. A 5 per cent solution of carbolic acid is also good.

Burn all diseased parts promptly after cutting. In summer this must be done the same day, otherwise insects crawling over them during the night might become carriers of the germs. In winter it is necessary to burn them before the first warm days of spring, but many have neglected this rule to their sorrow.

Inspect every tree carefully after the orchard has been gone over. Even an expert, when cutting out blight, has to do this two or three times to get every case, and a case or two left may ruin the whole campaign by starting the blight in the blossoms the next season.

PRUNING—Orchards in infested districts should be kept free from water sprouts at the foot of the trees, and from suckers and fruit spurs on the main limbs; otherwise the bacteria, entering through these tender parts, will quickly reach the roots or the trunk.

TILLAGE AND IRRIGATION—Anything that favors a rapid, succulent growth of the tree makes it more susceptible to blight. It is, therefore, most important that blighted orchards should have no more tillage and water during the first half of the growing season than are absolutely necessary to the making of the crop. Barnyard manure should be applied only to the more resistant varieties.

Kill the green apple aphid. Observation and experience have convinced us that the winged adult of this insect is the most important carrier of the blight after the bees stop working in the flowers. Thorough spraying with tobacco extract for the green aphid should greatly reduce the spread of blight during the summer.

The claim is sometimes made by those who have grown fruit in the East or the Middle West before coming here that the cutting out of blight is not necessary, that such a practice was very little followed where they came from and yet apples were grown with very little trouble from blight. It is a fact, however, that nearly every apple district, east and west, has a severe outbreak now and then that requires severe cutting.

(Continued on page 18)

BETTER FRUIT

**1/2 more land
cleared
per dollar**

—with **PACIFIC
STUMPING POWDER**
Save still more by
using the latest,
cheapest blasting
methods—



Preparing and Loading the Charge



1 Making the Hole

SLIT the cartridges (unless the ground is wet) and press each one down firmly in the bottom of the hole dug beneath the stump so as to form a compact mass without air spaces between cartridges. Next, prepare the priming cartridge as follows:

Cut fuse of a length sufficient to project six inches from top of hole. Be sure cut is made squarely across fuse, not diagonally. Remove one blasting cap from box with the fingers. (Do not use a wire, stick, or any other hard implement.) Next slip cap on end of fuse and crimp securely with cap crimper.

Punch a hole diagonally in side of cartridge with pointed handle of cap crimper, and insert cap with fuse attached. To keep cap from slipping out, tie a string around fuse and then around cartridge. Then place cartridge in hole on top of charge. Do not slit it. Cap should point toward bottom of bore hole.

The subsequent steps in stump blasting will be described in future issues of this paper.

Pacific Stumping Powder, the new du Pont Farm Dynamite, is the cheapest explosive for stumping. A 1 1/4 x 8 inch stick will do the work of a 1 3/8 x 8 inch stick of any standard stumping powder—and you get 1/2 more sticks of Pacific Stumping per dollar.

Order from your local dealer and write us for free copy of 125-page book "Development of Logged-off Lands," giving full instructions as to the use of dynamite for land clearing, ditching and tree planting.

E. I. DU PONT DE NEMOURS & CO., Inc.
Spokane Seattle Portland

NON-HEADACHE **DU PONT** NON-FREEZING
PACIFIC
STUMPING POWDER

Dusting of Trees, Vines, Etc. Bleaching, Etc.



ANCHOR BRAND SUBLIMED VELVET FLOWERS OF SULPHUR, also **EAGLE BRAND** and **FLEUR DE SOUFRE**, packed in double sacks, are the **FLUFFIEST** and **PUREST** sulphurs that money can buy.

The fine, light, **SNOWFLAKE-LIKE** particles float to every surface and crevice of the plant.

Do not adulterate these sulphurs with any inert material such as lime or Kaolin, etc. Coating the sulphur particles with an inert material **PREVENTS** the **FUMING ACTION** caused by the sun's rays.

Send for Circulars 6, 8 and 10 about our "Toro" Brand Agricultural Compound and booklet "The Truth About Sublimed Sulphur," also price list.

San Francisco Sulphur Co.

624 California Street

San Francisco, Cal.

Shipment of Green Prunes

By W. H. WICKS

Director Bureau of Plant Industry and Markets, Idaho State Department of Agriculture

AS THE state of Idaho has become the largest shipper of fresh Italian prunes it is of interest briefly to survey the commercial prune industry of the state from this angle.

An orchard survey made by inspectors of the bureau of plant industry, state department of agriculture in 1919, showed 3,962 acres devoted to commercial prune orchards. There is a strong demand for nursery stock and an increased acreage is manifest in our various sections adapted to prune growing which will result in enlarging the production of this delicious fruit. There apparently is no reason why southern Idaho, with its favored climatic conditions, soil, and already established markets and reputation for quality prunes, should not increase this industry to the fullest possibilities.

Experience has shown that prunes can be shipped from Idaho throughout the United States in fresh form with safety, and a number of cars have been marketed in English markets. Records show the number of carloads shipped out of Idaho during 1919 as 1,450 carloads of fresh Italian prunes, with a valuation of \$1,104,900. During 1920 there were 1,500 carloads shipped, bringing a return of \$1,143,000, while in 1921 there were 2,200 carloads shipped out with a valuation of \$1,760,000. For the past three-year period the total number of carloads shipped was 5,150 having a total valuation of \$4,007,900.

The major part of these prunes are grown in the Boise, Emmett, Payette and Weiser valleys and along the Snake river in various valleys in the vicinity of Parma, Caldwell, Nampa, Bliss and the Twin Falls section. The elevation, volcanic ash formation of the soil and climatic conditions all unite in producing the Italian prune to its highest state of perfection, both for shipping fresh to the market or evaporating and selling as dried prunes.

The suit-case pack and the four-basket crate have been standardized for shipping prunes, although there is a tendency on the part of some to use a lug box, while others have shipped in half and bushel baskets. During 1921 there were shipped as shown by the carloads inspected by the state department of agriculture, 1,225 carloads of suit-case pack, 194 cars of four-basket crates, 24 cars in lug boxes, 30 cars of half-bushel baskets and 20 cars of bushel baskets. The three and one-half inch suit-case is the Idaho standard for suit-case pack. One thousand, three hundred eighty-six suit cases per car is the rule, with a minimum weight per suit-case of 17 pounds. The general range is 17 to 22 pounds, mostly averaging 18 pounds net weight and the four-basket crate averaging 20 pounds net.

The standardization of farm products and shipping point inspection as conducted by the state department of agriculture, co-operating with the United States bureau of markets and crop estimates, has developed an inspection and standardization service which is being extensively used by growers, shippers and the trade, and has done much to standardize the quality and marketing of the Idaho prune.

THE markets for fresh prunes have been generally strong and good, with an increasing demand as shippers learn to distribute this fruit over the markets in the middle west and eastern states, instead of putting large shipments on the Chicago and New York markets, which may oftentimes become unable to consume such large quantities. The Idaho prune is marketed by individual growers, several large independent buyers, organizations, and an attempt has been made to market co-operatively. In 1921 cash f. o. b. sales were the rule, with consignment business practically nil.

The evaporator industry in Idaho is well established and is capable of taking care of much of the prune crop in case the market is not satisfactory for fresh prunes. More evaporators, however, could be built to the benefit of the prune industry and the owners operating the same. The output of dried prunes for 1921 was 950,000 pounds.

Of all the tree fruits grown commercially in Idaho, the prune is one of the surest and foremost money-makers in which one can engage. The problems of orchard management, such as soil fertility, irrigation, cultivation, pruning and spraying are being enthusiastically studied by prune growers and much progress is being made in the betterment of the prune orchards at this time. The highest record, which we are able to obtain for the production of Italian prunes in Idaho, is fifteen cars on nine acres. This orchard was seven years old at the time (1915) and located in the Emmett valley. The average production for the state is one car per acre.

The 1921 prices for fresh prunes ranged from \$40 to \$45 per ton. From all indications it seems reasonable to predict a rapid development of the Idaho prune industry and increased prosperity to the state as contributed by this substantial branch of horticulture.

The beautiful blossom scene picture which adorns the front cover this month was taken in the Yakima Valley, famous for the production of its fine apples and other fruits.

▲ ▲ ▲

Kindly mention *Better Fruit* when answering advertisements.

Tree Surgery

By JOSEPH F. TEEVIN

TREE surgery is like medical surgery—the greatest care must be exercised in its operation. All diseased parts must be removed. The smallest piece of mycelium or trace of growing fungi left in the tree will grow.

The heart rot is the worst fungus disease that fruit growers have to contend with. Of the two species, the black and the white, the latter is far the most destructive. The spores, blown by the wind, alight on a wound, but in dry weather will not grow. The ideal weather for its growth is warm weather.

The growth rapidly spreads, vertically sending its mycelium downward more rapidly than upward. As the growth continues it spreads horizontally until, in a badly diseased tree, nothing is left but a shell of sap-wood and bark.

Heart rot has to be cut out of the wood. The best tools for this work are a carpenter's chisel and a farrier's knife. Care must be taken not to cut out any more of the good wood than necessary. Cut a narrow slit in the wood right over the rot with the chisel, following the mycelium up and down until it is all clear. In cutting the rot out there must be care not to disturb the bark, for if it dies around the wound it will take longer to heal over. The farrier's knife is used to smooth up the incision. The open wound is then painted with Bordeaux paste, a mixture of lime and copper sulphate in equal parts.

When wounds are made on a tree by pruning or by accident a good coat of Bordeaux paste applied will save trouble later on. At the time this may seem a waste of time and money, but let the disease get a start and it will take far more time and money to get rid of it.

Land Clearing With Dynamite

COMPILATION of the actual figures in land clearing demonstrations covering all the western counties of Oregon and Washington during recent months has shown that the average acre of logged-off land to be cleared contains not to exceed more than 1,000 to 1,200 diameter inches of stumps to be removed. This represents about 85 to 100 diameter feet of stumps per acre and is equivalent to a maximum of 33 stumps averaging three feet in diameter or 25 stumps averaging four feet in diameter.

Figures on the amount of explosives required for clearing an acre of land are given in a recent report by E. I. duPont de Nemours Company. This states that 250 pounds, representing a total of 650 sticks of the new stumping dynamite, will easily remove either 33 stumps averaging three feet or 25 stumps averaging four feet in

diameter, in such thorough manner that snags and broken parts may be picked up or dragged to a central spot for burning, with practically no additional labor in pulling or cutting roots. Present cost of the stumping powder, or dynamite, is given at 5.38 cents a stick. This would represent an outlay of approximately \$35.

There would be required approximately 35 caps and probably 150 feet of fuse or, instead, perhaps 35 electric blasting caps. These materials, it is said, may be purchased most anywhere at an outlay of \$45 to \$50.

It is pointed out that these figures do not constitute an excessive cost of clearing logged-off lands in producing areas. Such costs serve to illustrate the point that, "even if the price of powder were cut in two, the difference to be saved thereby could in no way justify the withholding of suitable soil from development under present conditions and prices."

Detailed figures on costs of stumping powder are given in the report by way of refuting allegations that they are too high to permit of much general land clearing by this method. The figures seem to indicate that the new powder now in use is sold at almost exactly the same price as the old and less efficient powder cost in pre-war days. The actual difference is said to be only eight cents on 100 sticks.

In the past it has been the practice to use a 20 per cent dynamite or stumping powder, so called, for stump blasting and such powders averaged about 85 sticks to the 50 pound case, or 170 sticks to the 100 pounds.

The average carload price, f. o. b. point of manufacture, of 20 per cent stumping powders in the years 1909-14 was \$9 per 100 pounds and, based on 170 sticks to the 100 pounds, represented a cost of 5.3 cents per stick or \$5.30 per 100 sticks.

There are now manufactured, at least by the duPont Company, powders of an entirely different type, carrying a much greater number of sticks to each 100 pounds and, in carload lots, retailing at \$5.38 per 100 sticks, or 5.38 cents per stick. This cost is very nearly identical with that prevailing before the war.

The newer powders have special advantages, it is said, in being non-freezing, non-headache producing, in blasting stumps more thoroughly than the old types and in working better under all sorts of conditions that may be encountered.

It is shown in the report on land clearing in Washington and Oregon that there is further inducement to such development in the higher prices for farm commodities than were received in 1909-14. It is said that 100 bushels of wheat now purchases 1900 sticks of the new powder whereas the same amount then purchased 1700 sticks of a less efficient stumping explosive.

▲ ▲ ▲

In writing to our advertisers kindly mention *Better Fruit*.



Every Woman Loves to Paint

When She Knows How—Let Us Tell You

PAINTING is really fascinating work. Once you are started you'll probably not want to stop until you have refinished many things you did not intend to do at first.

Of course, there are some simple directions that must be followed if the work is to be successful, and we have a special "Home Service Paint Department" which was organized just to tell you how to paint.

Perhaps some of your furniture, floors, woodwork or walls are beginning to look a little old—just on the surface. Pick out one or two things to do. Tell us about them and how you want them to look when finished.

Our experts will tell you what materials to use, how to do the work step by step, what brushes you'll need, and everything about it.

For 73 years we have been making paints, varnishes, enamels, wall finishes and stains for women to use. They are the finest materials of their kind that we know.

Write for Fuller's Free Advice and refinish a few home things. You'll be surprised how fascinating the work is and how much you can save, too.

Free Advice

Write us now—a postcard—for Fuller's "Home Service" Paint Book, which tells you just what to buy for every kind of painting. Send full description and get our free advice on any kind of painting you want to do.

Decoret Varnish Stains for refinishing furniture and interior woodwork. They stain and varnish in one operation. Match the color of any natural wood. 8 colors.

Silkenwhite Enamel produces a rich, beautiful finish on woodwork and furniture. Flows on smoothly and does not show brush marks. Produces a mirror-smooth surface. Stays white and wears long. Gloss white, semi-gloss white and 8 colors.

Rubber Cement Floor Paint: A durable, sanitary, waterproof paint for floors of kitchens, closets, etc. Spreads easily, covers well. Dries hard over night. 12 colors.

Fullerwear: The all-purpose spar varnish which is unexcelled for all interior and exterior surfaces. Fine for linoleums, floors, woodwork, furniture, front doors and vestibules. Dries hard and glossy. Very durable.

Also makers of House Paint, Barn and Roof Paint, Washable Wall Finish, Tractor Paint, Fifteen-for-Floors Varnish, Auto Enamel, Porch and Step Paint, Fuller's Hot Water Wall Finish (kalsomine), Silo Paint, Milk Can Enamel, PIONEER WHITE LEAD, Implement Paint and Fuller's Oil Stains.



Fuller's SPECIFICATION "Home Service" Paints Varnishes - Enamels - Stains

Manufactured by W. P. Fuller & Co., Dept. M-24, San Francisco

Pioneer Paint Manufacturers for 73 years. Established 1819.

Branches in 19 cities in the West. Dealers Everywhere.

Free Book—Send Coupon

Send coupon for Fuller's "Home Service" Paint Guide, a free book which tells you how to paint and varnish home things, what brushes to use, etc.



Ask our Service Department any question about paint which you would like to have answered—complete detailed advice is given free.

W. P. Fuller & Co.
Dept. M-24, San Francisco.

Please send me without charge a copy of your "Home Service" Paint Guide.

Name.....

Address.....

City.....State.....

BETTER FRUIT

Published Monthly
byBetter Fruit Publishing Company
Twelfth and Jefferson Streets
PORTLAND, OREGONJERROLD OWEN.....Managing Editor
ERNEST C. POTTS.....Editor
C. I. MOODY.....Advertising Manager

EASTERN REPRESENTATIVES

PAUL W. & GUY F. MINNICK.....
..... 280 Madison Ave., New York City
JNO. D. ROSS.....608 Otis Bldg., Chicago
SAN FRANCISCO REPRESENTATIVE
EDWIN C. WILLIAMS
.....Hobart Bldg., San Francisco

STATE ASSOCIATE EDITORS

OREGON—H. P. Barss, Plant Pathologist, Corvallis; A. L. Lovett, Entomologist, Corvallis.
WASHINGTON—Dr. A. L. Melander, Entomologist; O. M. Morris, Horticulturist, Pullman.
COLORADO—C. P. Gillette, Director and Entomologist; E. B. House, Irrigation Expert, State Agricultural College, Fort Collins.
ARIZONA—F. J. Crider, Horticulturist, Tuscon.
MONTANA—H. Thornber, Victor.
CALIFORNIA—C. W. Woodworth, Entomologist, Berkeley; W. H. Volck, Entomologist, Watsonville; Leon D. Batchelor, Horticulturist, Riverside.
INDIANA—H. S. Jackson, Pathologist, Lafayette.All Communications should be addressed and
Remittances made payable to

BETTER FRUIT PUBLISHING COMPANY

Subscription Price:

In the United States, \$1.00 per year in advance;
three years, \$2; five years, \$3. Canada and
Foreign, including postage, \$2.00, payable in
American Exchange

Advertising Rates on Application.

VOL. XVI, NO. 12

Back to Prosperity

Slowly and painfully old National Prosperity is creeping back on the job. He is still wan and emaciated, but seems recognizable to the prophets of the country. They are just about a unit in forecasting his near approach and preparing a warm welcome for the long-absent old benefactor.

The fruit sections served by this magazine have reason for optimism. For one thing, they have come through the depression in much better shape than those sections devoted more exclusively to agricultural pursuits. If mushroom projects and shiftless orchardists have been squeezed out of the industry so much the better. The conscientious and capable grower fared well in 1921 and has so much the better foundation on which to build now than the farmer and livestock grower.

Fruit prospects of the Northwest for the present season are uniformly good. Labor costs are down; material prices have declined; transportation rates have

been reduced; foreign markets are strengthening; home markets have cleaned up remarkably well; frost visitations have worked little damage.

In short, the year 1922 has nearly every earmark of prosperity for our fruit growers. It looks like a year when a little extra optimism, coupled with industry, will yield adequate, even generous reward.

Prunes and Printer's Ink

Once in a while the power of advertising makes itself felt in a surprising way. Consider a recent illustration of this.

The Oregon Co-operative Growers' Association was offered an order of extensive proportions for dried prunes for the English trade, provided the prunes were labeled as a California product. The association officers were incensed at the proposal and practically ignored it. There was justification for their feeling of provocation, but that is not the point under discussion here.

In the offer to take Oregon prunes masquerading under a California label there was admission that there is no disparity between the two in quality. The obvious point, however, is that the English do not know this—that they demand dried prunes with a "California" label on them.

The explanation is all summed up in one word—advertising. The value of advertising was learned early and well in California. Astute leaders in the varied branches of that state's fruit industry have long been putting the power of advertising behind their products. There is nothing surprising in the fact that results have made themselves felt 7,000 miles distant, across the Atlantic.

Growers of the Pacific Northwest still lag behind when it comes to advertising their fruit and fruit products. While a majority seem to know that the money spent in judicious exploitation of their high-class products will eventually bring rich returns, others are too short-sighted to see or understand this. Too frequently the penny-wise

views of the near-sighted growers dictate the publicity policies of their organizations.

Continuous education and effort by the well-informed leaders is slowly bringing an awakening—an appreciation of the power of advertising. Meanwhile an occasional object lesson effectively speeds the waking up process.

Fruit and Health

In England, fruit dealers have been advertising the beneficial properties of oranges and pineapples for persons afflicted with the influenza.

This has resulted in no little comment upon the health-giving qualities of all varieties of fresh, ripe fruit. Said one writer: "Every fruiterer's shop window should display some notice drawing attention in some striking manner to fruit as food and medicine."

Not long ago the National Tuberculosis Association met in New York. Entirely upon merit and without solicitation, the association adopted California figs as a part of the diet recommended for under-nourished children. Bread, milk and figs constitute the lunch recommended for such children.

The California Peach and Fig Growers lost no time in giving co-operation and taking advantage of the advertising benefits the action of the tuberculosis association afforded. Fifteen hundred pounds of dried figs were immediately given, free, to the nutrition clinics.

Over in Idaho not a season passes that E. F. Stephens, dean of the state's orchardists, does not give several hundred boxes of apples to various hospitals and the state asylum. Back of this philanthropy is the knowledge that good accrues to the apple industry through this indirect advertising of apples as a health food.

Statements that fruits are Nature's own health foods are as old as the hills, but this fact gives no excuse for not everlastingly repeating the truth and taking fullest advantage of its advertising possibilities.

National Sales Body

A NATIONAL sales agency, the Federated Fruit Growers, to co-operatively market the American fruit crop was created a month ago in Chicago. J. S. Edwards was elected vice-president of the new organization and given managerial authority and instructed to proceed with the formation of a sales department.

The establishment of this agency is the result of the work of the Producers' National Fruit Marketing Committee appointed by the American Farm Bureau Federation to develop an improved marketing system for the fruit growers of America. This committee, consisting of 22 men, has made a complete analysis of the various factors affecting fruit marketing, has studied the work of the various co-operative fruit marketing organizations and as a result has developed a plan for the correlation of these local co-operatives into one national organization.

This temporary board of directors for the Federated Fruit Growers was appointed by the committee:

James Nicol, Michigan, president; J. S. Edwards, California, vice-president and acting general manager; W. B. Armstrong, Washington; Sheridan W. Baker, California; C. E. Durst, Illinois; B. F. Moomaw, Virginia; N. R. Peet, New York; C. E. Stewart, Florida.

J. S. Edwards, the vice-president, selected to act as general manager, represents western fruit growers. He is now president of the Gold Buckle Association, one of the largest growers' associations in California and is a director in the California Fruit Growers' Exchange and in the Fruit Growers' Supply Company.

The new organization will open offices in Chicago at once. National standardization of fruit grades and an advertising campaign to increase consumption of all fruit, will be two of the jobs undertaken by the Federated Fruit Growers.

Shippers' Convention

EVERY important apple growing district of the Pacific Northwest is making plans to entertain at least a portion of the delegates who will come to Seattle, in July, to attend the convention of the International Apple Shippers' Association. The Spokane district, Wenatchee, Yakima and Hood River growers and shippers all have tentative promise that groups of the visitors will pay them a call.

In Seattle a general committee has been busily at work for many weeks arranging for the convention. A. R. Currie is chairman of this committee. It is assured that the visiting shippers will not only be hewn a good time, but that many beneficial results will come from their sessions and investigations.

▲ ▲ ▲

Kindly mention *Better Fruit* when answering advertisements.

Do You Want Duty-Free POTASH?

Recently a United States Senator, who is actively engaged in trying to defeat the "joker" in the Free List which puts a 100 per cent duty on agricultural Potash, asked why the farmers were not represented at the hearings before the Senate Finance Committee when the subject was under consideration. A man, who attended these hearings, called the Senator's attention to the fact that three owners of farms had appeared, representing New Jersey, Missouri and Indiana; that the New Jersey Federation of County Boards of Agriculture, and the Representative of the New Jersey State Grange appeared; that the Representative of the National Grange made a statement; that the National Farm Bureau Federation and the Representative of the National Bureau of Farm Organizations had been actively working for free Potash, and that the Washington Representatives of these Agricultural Organizations represented millions of real farmers, who paid good money to belong to these organizations and to support their representation in Washington, upon whom they depended to look after legislation affecting farmers' interests.

Later on it developed that other Senators had this same thought—that the farmers were not asking that Potash remain on the Free List. There can be no question that all farmers most strongly object to paying two dollars for a dollar's worth of Potash.

Ten people, representing farmers, fertilizer manufacturers, producers of imported potash, and former producers of American potash, appeared before the Senate Finance Committee, or filed briefs on the subject.

Of these, nine asked that Potash remain on the Free List and one asked for the duty.

Why then have the Senators come to believe that farmers are indifferent about the matter?

The explanation is to be found in the fact that the "United States Potash Producers' Association" maintains in Washington an organization which is very active in urging a duty on the farmers' Potash. At the hearing their propagandist shouted: "Where was the American farmer yesterday? Where was the farmer of the South, who uses more Potash than any other farmer in the country? . . . Where was the American Farm Bureau Federation, which has its offices in Washington? Where was the National Bureau of Farm Organizations, representing thousands of farmers?"

This was clear bluff, for these organizations were represented and they have taken their stand squarely for Free Potash.

But the bluff, constantly repeated, seems to have made an impression that will be costly to the consumers of Potash, unless immediate steps are taken to show the Senators that farmers are very much in earnest about the matter. The farmers' representatives in Washington must be supported by the farmers at home.

"The only effective way to do this is for farmers to write to both of their United States Senators at Washington, urging them to see that the 'joker' at the end of Paragraph 1635 be struck out and that Potash used in fertilizers remain on the Free List, where it always has been."

The Senate is now considering the Tariff Bill. Write your Senators today.

During the time when foreign Potash could not be obtained, Potash sold at more than ten times the prewar or the present prices. Then the American producers, some of whom are called the "Borax Brigade", had the opportunity of profiteering to the limit, and of selling at very high prices Potash of an inferior, and sometimes injurious kind.

Now they ask for "protection" in the form of one of the most excessive duties in the whole Tariff Act.

Unless the farmers act promptly, they are likely to get it.

SOIL & CROP SERVICE, POTASH SYNDICATE

42 Broadway

H. A. HUSTON, Manager

New York



ATTRACTIVE
FRUIT CAN
FRUIT BOX
LABELS
EVAPORATED FRUIT
DRIED FRUIT
CARTONS
WINDOW DISPLAYS
POSTERS

WRITE OR TELEGRAPH FOR SAMPLES,
 PRICES AND IDEAS.

The
UNITED STATES PRINTING
& LITHOGRAPH CO.
 COLOR PRINTING HEADQUARTERS

HOGE BUILDING
 SEATTLE
 112 MARKET ST.
 SAN FRANCISCO

Pear and Apple Blight In Montana

(Continued from page 13)

RESISTANT VARIETIES—As already indicated, there is a great difference between varieties of apples and pears as to their susceptibility or resistance to this disease. Trees may be resistant in either of two respects or in both. First, if the blight germs get into the blossoms or the tender bark, a natural resistance of the trees may prevent them from getting a start in many cases. Second, if the disease gets a start in the blossoms, the leaves, or the tender shoots, it will in some susceptible varieties spread down into the bark of the larger branches, trunks or even roots; while in other varieties more resistant, it will die out early in the season, forming only a "twig blight." This kind of resistance is the more important.

Nothing is so essential in fighting this disease as to avoid planting certain susceptible varieties, which are almost certain to be killed if attacked, and to pull out or top-work those already growing. It would be impossible and quite useless to list here all known varieties of apples and pears and state the degree of susceptibility of each, for most of them have no commercial value in the state. Our fruit growers, however, may find here listed most of those varieties that have a commercial value in one or more important sections, and they should be guided by it in the setting of new orchards.

Class A.—Relatively resistant, *i. e.*, the blight seldom runs far in limbs more than one-half inch in diameter, and usually makes only a twig blight: Duchess of Oldenburg, Gano, Ben Davis, Rome Beauty, Wagener, Stayman, Winesap, Thompsons King.

Class B.—Moderately resistant, *i. e.*, the disease seldom runs far in limbs more than three-fourths inch in diameter, and usually makes only a twig blight: McIntosh Red, Jonathan, Delaware Red, Grimes Golden, Wealthy, Baldwin, Northwest Greening.

Class C.—Moderately susceptible, *i. e.*, the disease frequently penetrates the smaller limbs (an inch or less in diameter), but seldom the main limbs or the trunk: Yellow Transparent, Fameuse (Snow), Spitzenberg, Delicious, Whitney crab, Martha crab, Hyslop crab.

Class D.—Very susceptible, *i. e.*, many infections may appear in a tree; the blight extends rapidly into the larger limbs and trunks and the tree is usually killed: Alexander, Wolf River, Transcendent crab, McMahon, Winter Banana.



YOU'LL be surprised at the little cost at which you can make your house look distinctive. The window cut accompanying this ad, is known as the "Queen Anne" design.

For an additional \$15 or \$20 your whole house can have this classy window. Before you finish building send for our catalog. Rovig, 2227 First Avenue South, Seattle "Better Millwork."

TREES AND SHRUBS



Fruit trees budded from bearing orchards. Apple, Pear, Cherry, Peach, Plum, Prune, Apricot, Quince, Grape Vines, Shrubbery, Plants, Raspberries, Blackberries, Logans, Dewberries, Asparagus, Rhubarb, Flowering Shrubs, Roses, Vines, Hedge, Nut and Shade Trees. Carriage paid. Satisfaction guaranteed.

WASHINGTON NURSERY CO.
 Toppenish, Washington.
 Salesmen everywhere. More wanted.

BOXES

GROWERS—CANNERS

Let Us Figure With You on Your Needs
American Box & Crate Mfg. Co.
 PORTLAND, OREGON

In writing to our advertisers kindly mention *Better Fruit*.

IN CONSIDERING the foregoing lists the grower should understand that classes A, B, and C, rank quite close together and that any of those varieties can probably be grown successfully even in blight-infested districts of the state; while

between class C and D, there is a very wide difference, the latter being very much more susceptible. It is an exceedingly important fact that in trees belonging to classes A and B, the blight germs nearly always die out in the bark before winter and almost never live over until the next spring, while in those belonging to class C, they frequently live over winter, and in those of Class D they quite regularly do so and thus start a new infection in the orchards at blossoming time. Our orchardists should not attempt longer to grow these five varieties. They are doomed to be replaced by others that are more resistant. It would be most unwise, therefore, for a grower to set them out.

As for the trees of susceptible varieties that have already been planted and have reached the age of bearing, they may be top-worked to varieties more resistant. Trees thus treated, if kept free from water-sprouts will make valuable orchards and will thrive even in the midst of blight; only occasional trees being lost. If, however, the water-sprouts are allowed to grow, they furnish the blight with a quick and easy path to the root of the tree, and the orchard may thus be ruined.

RELATIVE RESISTANCE OF THE PEAR— Pears have been grown only to a limited extent in Montana, but those trees that have come into bearing have proved so profitable that something should be said for the guidance of those who may be thinking of planting them more extensively.

It is a misconception that pear trees growing in any locality are a special menace to the apple industry. Pears are no more likely to contract blight than apples; and if they have it and the owner desires to fight it he will find it not so difficult to combat in the pear as in the susceptible apple.

The reason for this is that the normal bark of the pear is lighter in color and the blighted portions darker than in the apple; it is therefore easier to find all the blighted limbs. In general, we may say that it is much easier to control the blight in pears than in apples listed in class D.

Pears, like apples, differ in their susceptibility to this disease. The Clapp's Favorite, for example, blights so badly that it can not be grown commercially with profit. The Kieffer, on the other hand, is about as resistant as the apples in class B. Unfortunately, it is not a first-class variety for eating, though it is prized by the canneries. There are three other varieties that have commercial possibilities in this state, the Bartlett, Buerre d'Anjou, and Flemish Beauty. Of these the Bartlett is the most susceptible, though hundreds of thousands of trees are being grown where blight has existed for years. Buerre d'Anjou is decidedly the most resistant, being raised profitably in Colorado, for example, where the blight has greatly injured most other varieties. Both of these are decidedly

superior in quality of fruit to the Flemish Beauty.

All pear orchards grown where blight is found will develop some cases in the tops—many of them if the orchards are neglected.

These may be controlled, however, by the methods outlined here. The principal loss of trees is caused by the blight's running down the limbs into the trunks, or, worse yet, by its reaching the roots through the water-sprouts. To avoid this loss it is important that a pear tree shall have a body and roots of a variety resistant to blight and not likely to sprout. Use for a stock the Chinese sand pear, often called "Japanese" stock, which is much more resistant than the French seedling and does not sucker so badly. Upon this graft the Kieffer or some equally resistant scion. Set deep in the ground so that the roots will be sent out above the union.

In pruning leave four main limbs, and the second or third year after grafting top-work these limbs to the desired variety—for example, Buerre d'Anjou. The buds or grafts should be set one to two feet from the trunk. This will make a fine, large tree; and should the blight run down a limb to the point of union it will there be checked, and a new limb can be grown in the place of the one lost. For convenience one may order from the nursery Kieffer stock on "Japanese" roots and do the top-working himself at the proper time. This system has been thoroughly tried and we recommend it unqualifiedly to those who wish to grow this much-prized fruit.

Pointers on Painting

PAINTS and painting cost less than repairs necessitated by decay or disintegration.

There is no such thing as an all-service paint. Paint should be selected according to the material to be painted and the conditions under which it must give service. The wear on a floor is more severe than on a wall; hence the floor calls for a tougher, more elastic paint.

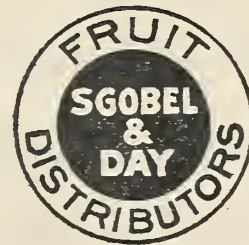
Painting should not be done when the temperature is lower than 50 F. degrees as the paint will not flow well. It is impractical to paint a hot surface. The old painting axiom is: In spring and fall follow the sun; in summer, follow the shade.

Outside painting should be done in dry weather. Surfaces should not be painted when wet.

Surfaces to be painted should be gotten as smooth and clean as possible. They should be free from grease. If painting new wood, knots and sappy surfaces should be shellaced first. If painting over previously painted surfaces, all blisters and loose or peeled spots should be scraped or burned clean. A brushing with a stiff wire brush followed by sandpaper is good practice.

▲ ▲ ▲

Advertisers appreciate mention of the fact that you read their ad in *Better Fruit*.



SGOBEL & DAY

An International Sales Organization

Established 1869

General Offices

202-204 Franklin Street,
New York, N. Y.

Horace W. Day, President

James S. Stokes, Vice-President

Walter H. Young, Manager

Kenneth H. Day, Sec. Sales Manager

Northwestern Offices

Spalding Bldg.,
Portland, Oregon

C. W. McCullagh, Northwestern Manager
Portland, Oregon

District Representatives

Louis A. Blunck, Weiser, Idaho

Ernest Carpenter, Yakima, Wash.

Stanley Armstrong, Wenatchee, Wash.

J. Arthur Riggs, Hood River, Ore.

Crawford C. Lemmon, Medford, Ore.

Paul McKercher, White Salmon, Wash.

Selling In All Leading Markets

Superior Sales Service



Why Successful Orchardists Come Back to Us for Stock

A fact—by far more fruit trees now in Washington orchards were purchased from us than from any other nursery.

During 19 years, as customers have increased their orchard acreage, steady repeat orders have been proving that we enjoy public confidence—the only lasting basis for success in the nursery business.

Because we grow and sell only hardy, matured nursery stock, well-rooted and free from disease—because we won't sell you stock unless we believe it will meet your requirements—because we are here to stay—our guarantee means something.

You can depend upon golden-rule treatment in selecting your stock here. Write and let us help you.

**Washington Nursery
Company**

Your Tree Men Since 1903

Toppenish, Wash.

For Control of Aphis— Spray with APHOIL

Which is also an efficient Spreader.

Write for information

Hood River Spray Co.

HOOD RIVER, OREGON

Manufacturers of DORMOIL

In Defense of Scalecide

By B. G. PRATT.

President B. G. Pratt Company, New York

It is a bit unusual to give space to an article defending and praising a specific spray material, but it was an unusual thing for a publication such as BETTER FRUIT to print a story of spray results with brand names all given as we did in the March issue. Discussion was urged and good has come from the interest thus aroused. The picture to which Mr. Pratt refers was not furnished by Professor Parker, but by C. C. Vincent, whose article appeared last month and, according to his report, dealt with tests almost exclusively with Mr. Pratt's miscible oil spray. With regard to the retardation of buds, Professor Vincent admits it may have been partly due to poor condition of the trees as they entered the winter period.

IN THE March issue of BETTER FRUIT, I see a full report of Professor J. R. Parker on leaf roller work in Montana and, as you request a discussion, I am availing myself of the opportunity, not as a criticism, but in the hope that it may be of help to someone.

Naturally, this report is very disappointing to me in that Scalecide should have made such a poor showing, but fortunately, its reputation was not made in a day; neither do I believe it will be lost by one experiment. But the surprising thing to me is that the field experiments with all the oils used, was so poor—the best not killing 75 per cent leaf roller. This is not effective spraying.

The best field work with any oil in Mr. Parker's report is poorer than the poorest work ever reported with Scalecide heretofore during the past ten years. Circular No. 26, Colorado Experiment station, reports 100 per cent leaf roller killed with Scalecide, using 1 to 12, 1 to 15, 1 to 20, and even 1 to 25 parts of water. Cornell bulletin No. 367, reports 96.2 per cent killed in field work where thorough work was attempted, and from 79 to 82 per cent where, admittedly light application was made and under unfavorable weather conditions, and adding "there was no appearance of injury due to the oils."

What was the matter with the Montana tests? I must admit my inability to tell with any degree of certainty; from the data available. I do not believe that any one else has had as long or as wide an experience as I have in handling miscible oils and believe I know what can be expected from them. Any good miscible oil should have given better results.

For seventeen years I have fought

against a coarse spray and for several years past a coarse, driving spray, (the spray gun at high pressure). I have 35,000 trees and the spray gun would mean the saving of much time in spraying, but I would lose in efficiency, so I do not use them.

The spray injury as reported to a greater or less extent from all of the oils, I do not attribute to the lateness of the spray, but I believe is entirely due to the spray gun (provided the oils all emulsified properly). The difference in injury from the different oils and on different trees can be accounted for by the different men handling the spray gun, or, the position the same man held the gun on different trees. The closer to the tree, or the wider the opening used, the greater the injury.

In my own orchards, where I use a cluster of fine nozzles, I have on several occasions finished my Scalecide spray only two or three days before we started the pink or cluster bud spray without the least injury. I do know, however, of severe injury to buds earlier than this with a coarse, driving spray. You can drive an oil spray into the folds of the expanding buds where it would be impossible to drive lime-sulfur. But why drive? You cannot do effective spraying by splashing the material on the trees, no matter how hard you splash it. A mist will cover completely, give better results and no injury.

The photograph on page six, showing the retarding of the buds by the use of miscible oils, is misleading and due, we believe, to the driving spray. The June, 1918, issue of the *South African Fruit Grower* had a picture showing the opposite condition on trees sprayed for five years with Scalecide.

We agree with you fully that "experiments with spray materials, when scientifically carried out by experts, are certain to add something to the sum total of existing knowledge about them." But they are often too sporadic and not continued long enough to eliminate the natural margin of errors.

I am glad to report that the experiment in Montana is to be repeated this year, and I sincerely hope that better results will be obtained with all the oils used.

I assure you that I will be pleased to know that an oil or oils are made on the Pacific Coast that will control leaf roller as well as Scalecide has always done before and will, in all probability do again, for it hurts me to pay such a tremendous tax to the railroad. When the time comes that Scalecide will be indispensable to the Northwest fruit grower, we hope conditions will arise that will greatly reduce or eliminate this extra tax.

▲ ▲ ▲

Advertisers appreciate mention of the fact that you read their ad in *Better Fruit*.

Care of Raspberries and Evergreens

(Continued from page 7)

ground, and carry the new canes overhead, up between the bearing canes during June, July and August. In February, they are dropped to the lower trellis. That is the plan that is being used very commonly with some of our better plantings in the Puyallup valley.

The canes overhead mature the wood better, are hardier when carried up than on the trellis underneath, and go through the winter better. In 1919, in adjoining fields, where the canes were carried overhead there was practically no winter injury. The disadvantage is that it is a little hard to get them up during July and August. It is easier to drop them than it is to carry the new canes up to the bearing trellis.

WHERE we use a commercial fertilizer we like to have about a 2-10 or a 2-8 or a 2-4 combination. On our sandier soils we believe in a great deal of phosphorous. Where we might ordinarily use a 2-8 fertilizer, we like to use a little more phosphorous because we find that the plants respond on that lighter soil where considerable phosphorous is used.

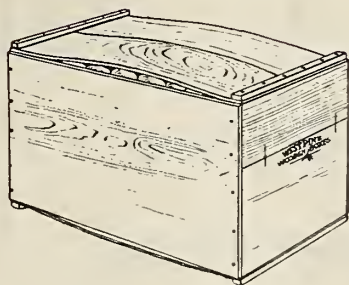
One common practice that our growers are using now is the combination of poultry and berries. Almost every berry grower, 75 or 80 per cent, now have some poultry in connection with their berry plantation. At certain times of the year they let the poultry run in the berries. The poultry helps cultivate the hills, keep down weeds and grass between the plants, and also aids in fertilization. One man a few years ago said: "If my poultry did not lay an egg they would pay for themselves in the benefit they do to the field, in fertilizing and scratching. I consider that the eggs they lay are clear velvet." So we are using fertilizers now that have hen manure as the chief element and supplement that with phosphorous and potash.

After planting Evergreens we get a paying crop in about three years. We will get a light crop the second year, a little heavier the next year. The second year we would get about 25 crates, the third 100. A crate weighs about 20 pounds—18 of berries. The fourth year they give us a little heavier crop, the fifth year we can expect five to seven tons to the acre.

New officers of the Skookum Packers Association are: I. H. Logue, president; C. W. White, first vice-president; A. E. Munson, second vice-president; Miss Grace Lamphere secretary-treasurer; J. A. Warman, general manager.

▲ ▲ ▲

Large numbers of Delicious apple trees have been planted in the Yakima district this spring.



Westpine boxes are MORE than mere containers

WESTPINE boxes are more than merely containers for your crop—they are protection and insurance.

Strong and sturdy Westpine boxes save your fruit—your profits—from losses in storage, rough handling and the weaving motion of shipping.

In Westpine boxes your apples reach the market in perfect condition. They find ready sale.

Be sure you use Westpine boxes this year. They are made from thoroughly seasoned and inspected western white pine. They afford your apples needed protection.

Write today for "The How and Why of Good Wood Boxes," a handbook on the proper construction and nailing of wood boxes. It gives results of U. S. government tests on apple boxes.

Box Bureau, Western Pine Manufacturers' Association
510 Yeon Building, Portland, Oregon



Get More Money For Your Fruit

You can average higher prices for your fruits by selling them at public sale than in any other way. And the selling cost will be lower. In addition, you get your money within twenty-four hours after sale. Write for free copy of booklet, "More Dollars for Fruit Growers."

The Fruit Auction Co.
Established 1896
202-208 Franklin St., New York, N. Y.

Codling Moth

This destructive pest requires utmost vigilance. Use ORTHO DRY ARSENATE OF LEAD. Uniform in strength. Mixes perfectly, and stays in suspension a long time.

Write for Ortho Circular

CALIFORNIA SPRAY-CHEMICAL COMPANY
WATSONVILLE, CALIF.

Address Dept. F.





The Casein Spreader

*Makes your spray spread
and stay*

giving full protection to
bark, foliage and fruit.

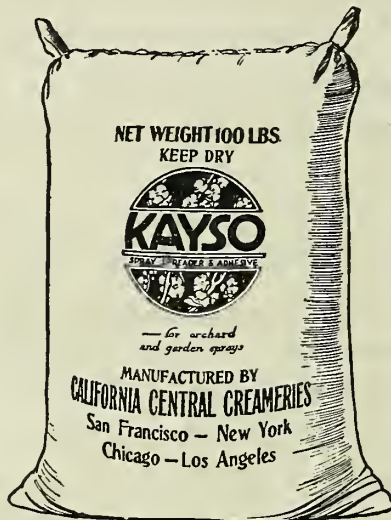
Use Kayso with all sprays.

Ask your dealer — or
write today for circular.

**CALIFORNIA CENTRAL
CREAMERIES**

425 Battery Street, San Francisco

LOS ANGELES CHICAGO NEW YORK



Safe—Economical—Convenient

Are there CURLED LEAVES on Your Apple Trees

Then get busy. That's a sure sign of Aphis. These little insects are sucking the life out of your trees. Kill them unless you want a small crop of dwarfed, specked fruit. You also run the risk of Aphis killing your trees. Spray at once with

Black Leaf 40
40% Nicotine

**Kills
Aphis**

Recommended by agricultural colleges and experiment stations. Don't make the very common mistake of thinking that Lime-Sulphur, Arsenate of Lead or Bordeaux kills Aphis. They don't, but if you are using those sprays, simply add Black Leaf 40 properly diluted, and make one spraying do double duty. Aphis also attacks Peach, Plum, Cherry as well as many vegetables and plants. Black Leaf 40 is highly concentrated so that only a small amount is required. The cost is small—only a few cents per tree. Free Spray Chart. Your dealer has Black Leaf 40 and one of our free spray charts. If he is out, write us direct.

**Tobacco By-Products &
Chemical Corporation**

Incorporated

LOUISVILLE, KY.

Pollination of Filbert Varieties

(Continued from page 11)

abnormal year rather than just enough for the normal year.

The Daviana works best on Du Chilly and less on the Barcelona and the White Aveline does the reverse. Clackamas is excellent for Du Chilly, but not for Barcelona. Alpha is excellent on Du Chilly. Nottingham and Cosford are both excellent on Barcelona, but lighter on Du Chilly. These two latter varieties gave the best results on Barcelona, but are very scarce.

For some time to come it will be necessary to plant the varieties at hand even if later experiments show that these odd varieties being tested are sufficiently good to warrant propagation. Even with the varieties at hand it will be difficult to furnish the proper number of pollenizers and may be necessary to limit the number to the minimum.

With the development of the filbert industry came the usual confusion and as a result there is considerable uncertainty as to the names of varieties being distributed. For that reason it would seem advisable for the prospective grower to purchase all his nursery stock from one man and use the combination of varieties that is giving the seller good results in pollination.

Experimental work has not been carried on far enough to establish for a certainty the best pollenizers for any one variety. Future work may upset some of the data at hand, but one thing seems to be certain, filbert varieties are self-sterile.

In writing to our advertisers kindly mention *Better Fruit*.

Chicago, Ill.,
May 19, 1922

MR. JERROLD OWEN,
Managing Editor, BETTER FRUIT,
Portland, Oregon

MY DEAR MR. OWEN: I have just finished a very careful reading of the May issue of your worthy publication. While it is not the largest or best illustrated of the many good issues you have put out, I must say that I believe it is far and away the best and most constructive copy of BETTER FRUIT which I have ever seen. It is intensely practical and should be of greatest possible value to the men who read its admonition and act upon its suggestion and instruction.

Sincerely yours,

E. E. CRITCHFIELD

Wild Birds as Pest Destroyers

By J. HOWARD WRIGHT,
Yakima, Washington

FEW PEOPLE consider the value that bird life has to the orchardist and farmer. Only in recent years have state legislatures and congress realized this and begun making laws for the protection of birds. Campaigns have been put on in our public schools to interest the child in birds. Where once the small boy was accustomed to hunt them with his air-rifle, he is now constructing bird-houses for their comfort.

Our wild life is fast to disappear unless stronger measures be taken for its protection. Many sportsmen seem to think all game was created for their pleasure in shooting it.

One of the most common of our birds is the robin. It is distinctly a companion of man, and wherever his hand has cleared the wilderness the robin has followed. He should be given all the protection possible, on account of his economic value as a destroyer of injurious insects, in spite of his fondness for small fruits at times. The food of the robin consists mostly of insects and their larva. The insects eaten include grasshoppers, bugs, beetles, weevils, and such larva as wireworms and cutworms.

The cheery call of the bob-white was one of the first distinctive sounds that many of us knew and loved as children. Perhaps there is no bird to which the American people are more deeply indebted for material benefit. He is a bird of the home, the farm, garden and field; the friend and companion of mankind; a much needed helper and destroyer of insect pests and weeds. He feeds entirely on the ground, except when driven by deep snows to seek berries and seeds from the shrubbery.

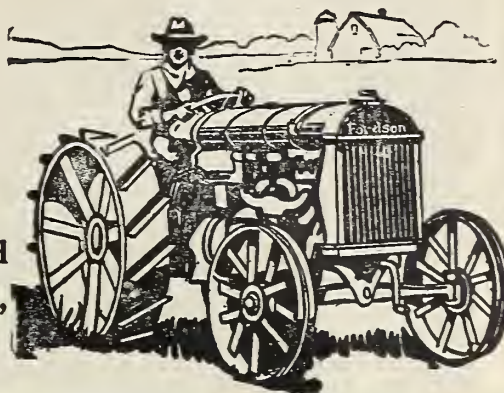
Through investigation by the Department of Agriculture it is found that the bob-white ranks very high as a destroyer of many of the most destructive insect pests. Among those eaten are the potato beetles, cucumber beetles, wireworms, weevils, grasshoppers, chinch-bugs, squash-bugs and caterpillars. As a destroyer of weeds the bob-white stands pre-eminent.

Every one knows the meadow lark. The food of the lark is gathered from the ground. Three-fourths of it, taking the whole year together, consists of insects, and the other one-fourth of weed seeds and grain. The grain is waste taken from the field during the winter months. Examination of a large collection of stomachs, and other sources of evidence show the range of insects caught and eaten by this bird. Among the insects found were ground beetles, the justly hated white-grub, weevils caterpillars, cutworms, wireworms, chinch-bugs, grasshoppers and crickets.

Another one of our common birds is the woodpecker. With the possible exception

DO ALL YOUR WORK WITH THE FORDSON

Plow, Harrow, Thresh, Grind
Feed, Fill the Silo, Pump Water,
Pull Stumps, Cut Wood, etc.



FORDSON REDUCED
TRACTORS \$230
NOW \$395 F.O.B. DETROIT

The new price makes the Fordson more attractive than ever, sign the coupon and arrange for a FREE demonstration.

NORTHWEST FORD DEALERS

Dept. B, 700 Fairview Ave., Seattle

Dept. B, East 11th and Division Sts., Portland

Please send me free information on Fordson Tractors. (Mark X in square opposite literature or service desired.)

☐ Fordson Tractor Manual.

☐ The Fordson at Work.

☐ Free Demonstration. (State purpose for which tractor is intended.)

If you own a tractor, state what make

Name

Address

GRASSELLI

May is *Arsenate of Lead* month. Get your order in now. (The supply may be limited.)

GRASSELLI

Arsenate of Lead,
Calcium Arsenate,
Lime Sulphur Solution, Bordeaux Mixture.

GRASSELLI GRADE Arsenate of Lead means—

1. It is actual GRASSELLI grade—the same famous quality that has made GRASSELLI the foremost name in the chemical world.

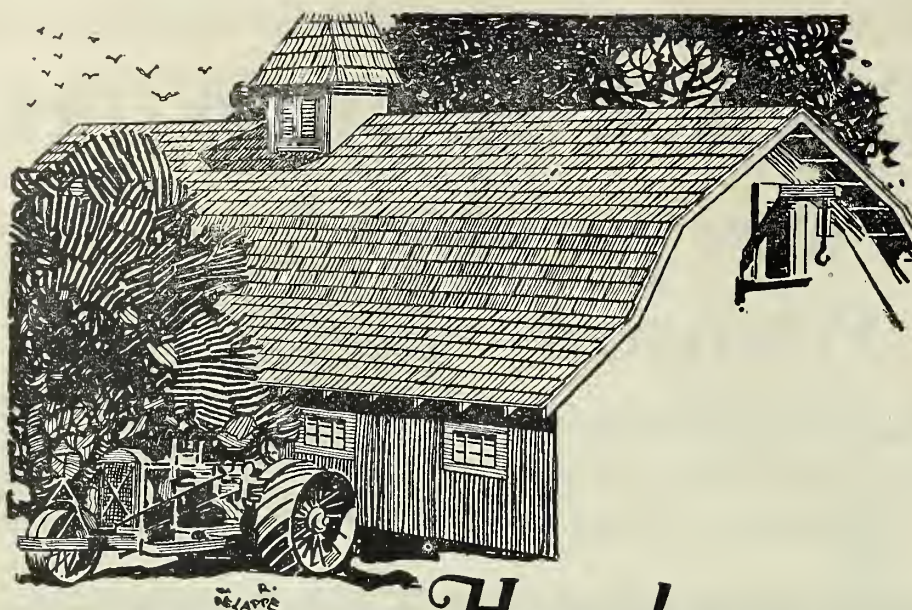
2. It has the certified purity, strength and uniformity of all Spray Products bearing the Grasselli Label and Guarantee.

3. It is backed by Grasselli's 83 years of leadership in the chemical field—our carefully guarded reputation is your protection and warranty.

Ask for GRASSELLI Insecticides and Fungicides and INSURE RESULTS in spraying.

Established 1839

THE GRASSELLI CHEMICAL CO., CLEVELAND



How long should a shingle roof last?

Answer that by another question—How much service in a tractor? Depends largely on the care you take of it. Same for a shingle roof.

Unless you fill the pores of the wood with a weather-resisting preservative, natural oils will evaporate, rain will soak in, then shingles will warp and crack under the hot sun and withering winds.

ORONITE SHINGLE OIL made by Standard Oil Company (California), is easy to apply, and will save your shingle roofs or shingled side-walls many a repair job. A tight, well-laid roof treated with it should last a lifetime.

Our agent near you will tell you the success others have had with ORONITE SHINGLE OIL in securing longer roof life. Ask him, too, for color-mixing formulas.

STANDARD OIL COMPANY
(California)



ORONITE SHINGLE OIL

of the crow no bird has been subject to so much criticism as he. When he is seen scrambling over fruit trees and his hole is found in the bark it is concluded that he is doing harm. The woodpecker obtains a large part of his food from the trees. Most birds must get their insect food from the air or the surface of the bark, but the woodpecker is able to get many larva and grubs beneath the bark. He is able to locate his hidden prey with great accuracy and often cuts small holes directly to the burrows of the grubs. He rarely disfigures a tree that is healthy, but when he finds a tree infested with wood-boring larvae, he locates the insects accurately, draws them out and devours them.

Among the smaller woodpeckers are the hairy and downy. Both of these are birds from which the orchardist and forester have nothing to fear and much to gain. The number of useful insects which they eat is insignificant, while the number of destructive larva they destroy must have a very great effect in reducing the number of pests. More than three-fourths of the food of these birds consists of animal matter and less than one-fourth is fruit and this mostly wild. This ratio is maintained very closely the year around.

THE most persecuted of all our birds are the hawks and owls. Because a few of them are destructive, all are considered such. All may be divided into three classes. Those most beneficial, include the marsh hawk, red-tailed hawk, red-shouldered hawk, and sparrow hawk. Those in which the harmful and beneficial qualities balance are the golden eagle, bald eagle, pigeon hawk, prairie falcon and great horned owl. Those of the harmful class, include the duck hawk, sharp-shinned hawk and Cooper's hawk.

The food of the marsh hawk is quite largely small quadrupeds, although in some localities it may include birds. An average pair, in rearing their young, would destroy in the neighborhood of 1000 mice during the nesting period. How much would an orchardist give if he knew so large a number of mice were to be destroyed in his orchard?

A campaign of education teaching the difference between the good and bad birds of the hawk family is having its effects, and agriculturists are realizing that but few birds of prey are more harmful than beneficial. It is the opinion of many that there are only three hawks deserving to be destroyed—the sharp-shinned, Cooper's and Gos hawk. There are a few others that acquire a taste for poultry and it may be necessary to eliminate a particular individual occasionally, but the wholesale destruction of hawks brings punishment by an increase of quadruped and insect pests.

Among the owls the common screech owl is probably best known. A considerable number of them make their homes in the orchards, and the man who is so for-

Musical
Merchandise

Write
Us

WE SAVE YOU MONEY!

W. Martius Music House, Inc.

1009 First Avenue, Seattle, Washington
Everything Known in Music

SHEET
MUSIC

Write
Us

tunate as to have screech owls attach themselves to his orchard should consider himself especially favored, for the good they will do in keeping mice down is beyond calculation. Now that mice are becoming such a menace to many orchards, certainly everything possible should be done to preserve these owls. They are with us the year around.

Another thing about the owl and one that is particularly valuable, is that it hunts for food at night when most other birds are at rest. It thus follows up the day-work of the rodent-eating hawks, providing a continuous check on the four-footed vermin of the ground.

Practically all birds have some value to us. There are many more that have not been mentioned in this article. Some that must not be overlooked are members of the finch family. There are largely seed eaters, destroying immense quantities of weed and grass seeds. Blackbirds also live on insects and seeds. There are the little chickadees, and nuthatches, who spend the winter in large flocks, always busy hunting on the bark of the trees the small insects the woodpeckers overlooked.

The fly catchers, including the phoebe birds, and king-birds are capturing their food supplies from the air throughout the summer. Last but not least in value are the warblers, constituting a very large family. The food of these birds is very small insects, such as plant lice, including aphids and scale, which are such a nuisance to the fruit and vegetable grower.

Benefits from Organic Fertilizers

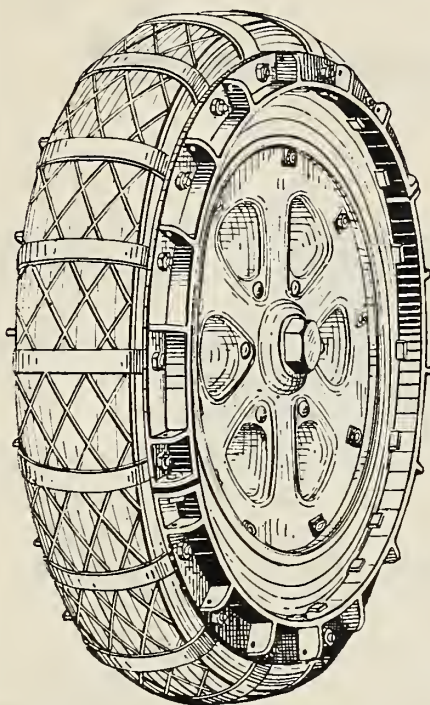
(Continued from page 8)

seventy per cent. This discovery refutes the idea that nitrogen alone is responsible for the increase of the leaf growth.

To quote from Mr. Long's article in the *Saturday Evening Post*: "This better leaf production in the early growth stage is especially important, because the leaf's ability to absorb carbonic acid gas depends upon its size. Therefrom follows the fact—proved when Riedel interrupted the gas supply—that the young gassed plant with its abnormally large leaves extracts an extra dose of carbon also from out of the ordinary air, so that carbon fertilization, even if carried on for only a few days, in the early growth period, largely increases the ultimate size and weight of the crop."

The second great result from Riedel's experiments was that even by gassing for only a few weeks, crop yields of all kinds, fruits, grains and roots, were immensely increased in quantity, size and quality. The increases ranged from 36 per cent to 200 per cent. Whereupon, Riedel declares that carbon fertilization without other fertilizer promotes plant growth more effectively than all ordinary fertilizers, when these are used without artificially supplied carbon dioxide. By ordinary fertil-

Truck Traction



Ever Get Stuck

in the orchard with your truck? Ever start for the warehouse with half the load your truck could pull because you were afraid of that one wet place in the road?

Of course you have, but you need do so no more!

Foley Traction-Rims

cure traction troubles—save tires

Write for description and prices to

Foley Traction-Rim Company

109-111 Tenth Street
Minneapolis Minnesota

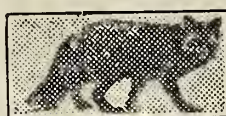
Dealers Write for Territory

LADDERS

Write us for prices and specifications on Orchard or any other style of ladders.

Nelson's Ladder Wks.

267 Second Street Portland, Ore.



Pedigree Silver and Cross FOXES for sale. Prices Reasonable. Write for information.
William D. Rambo
407 Sprague Ave.
Spokane Wash.

SERVICE IS OUR FIRST N-AIM



THE
SIMPSON & DOELLER
CO.
1423-24 N.W. BANK BLDG.
PORTLAND, OREGON.

GET OUR SAMPLES
AND PRICES

WE CAN FILL YOUR
ORDER FOR STOCK
APPLE, PEAR, CHERRY
AND STRAWBERRY LABELS
IN 24 HOURS.

A deadly spray

—and it costs only two cents
a gallon to spray with
Hall's Nicotine Sulphate.

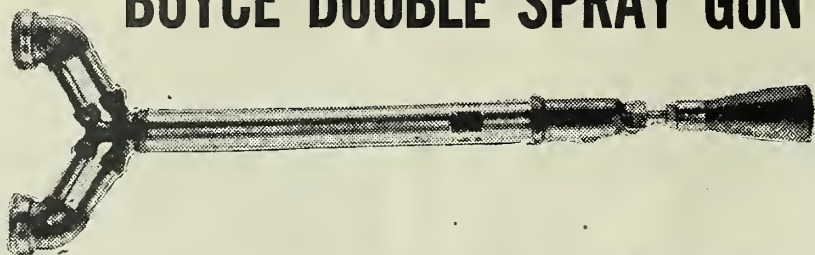


HALL'S

NICOTINE
INSECTICIDES

HALL TOBACCO CHEMICAL CO.
3919 Park Ave., St. Louis, Mo

BOYCE DOUBLE SPRAY GUN



The Only Double Nozzle Gun Possessing Both Long and Short Range. Thoroughly tested and approved in twelve different states, by leading fruit-growers

Adapted to use on any spray rig. Capacity 7 gallons per minute.

Requires less power than two single guns.

One nozzle can be used as single gun for small trees

Saves one man's labor

Economy of material; rapidity of application—"I can do the work of two men," said by many users. A better mist, better covering—which means less mildew, fewer worms, more "Extra Fancys"

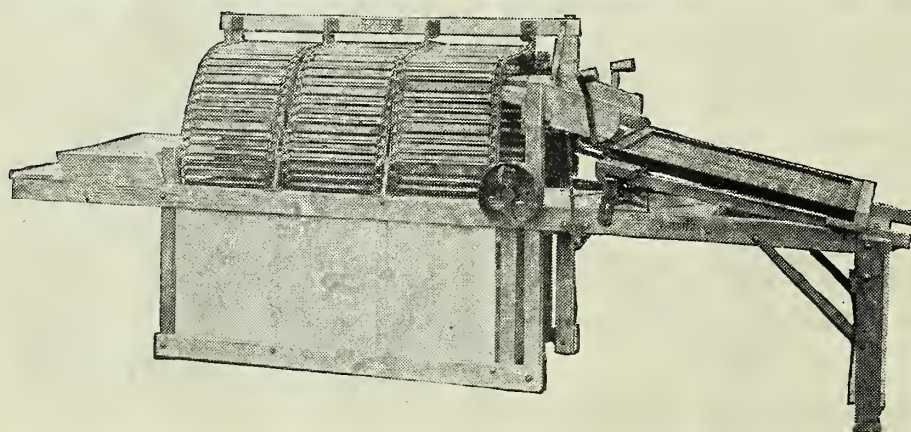
TRY IT. YOU WILL LIKE IT.

Price \$15.00. Sent on receipt of P. O. order

M. L. DEAN, Western Distributor

Telephone 931 Blue 631 Douglas Street Wenatchee, Wash.

OUR POWER PRUNE TRAYERS ARE BEST BY TEST



This prune dipper and trayer is our three tank machine for hot and cold water. We also make a single tank machine for one dip in cold water. These power trayers have large capacity quality work, built strong, largest machine only twelve feet long, requires any light power to operate, and will not crush the softest fruit. Buy the old reliable, tested many seasons. Prices right.

SALEM MFG. CO.

SALEM, OREGON

FACTORY LOCATED 136 N. FRONT and HOOD ST.

PLANTING

Salem Nursery Co.

FRUIT, NUT AND
ORNAMENTAL
TREES

WILL BRING YOU
SATISFACTION
NOW IS THE TIME
TO ORDER

Write

Salem Nursery Co.

428 Oregon Bldg. SALEM, OREGON

Additional Salesmen Wanted



*Northwest
Orchard
Ladders*

"The Quality Line"

For Sale by

Leading Dealers Everywhere

Manufactured By

**Northwest Fence and
Wire Works**
PORTLAND, OREGON

izers, he evidently has reference to the purely chemical, or inorganic, since animal fertilizers do immensely stimulate the production of carbon dioxide.

The conclusions arrived at by Riedel seem to point to the use of organic fertilizers and aerated soil as the most practical methods now available to the farmer for increasing the amount of carbon dioxide for his crops, since it is not as yet commercially practicable for every farmer to obtain carbon dioxide on a large scale for artificially fertilizing his crops.

One of the organic fertilizers used with marked success for a number of years in the states of Washington and Oregon, is a manufactured orchard dressing having an analysis of 6-10-14. Letters from prominent orchardists in the two states tell of success in the use of this fertilizer. They speak of obtaining maximum quality and quantity crop returns over a period of years. They seldom experience "skip" crops.

Fruit inspectors recently discovered root nematode while examining fruit trees at Cottage Grove, Ore.

Your magazine is excellent. Keep up the good work.—Ross T. Mayer, Washington.

OREGON

AT THE annual meeting of the Oregon Growers' Co-operative Association in Salem, general manager Robert C. Paulus reported that business transacted for the year 1921 very closely approximated \$2,000,000. Of dried prunes 7,250,000 pounds were handled. Over 200 cars of apples were shipped, averaging about \$1000 to the car. Officers elected by the board of 21 directors were: Kenneth Miller, Sheridan, president; P. S. Woodin, Grants Pass, first vice-president; Allan Bellinger, Scotts Mills, second vice-president. The executive committee is comprised of Messrs. Miller, Bellinger, G. E. Sanders, W. B. Biddle and R. W. Hinkley.

CHECKS covering the fourth distribution since Christmas were recently mailed by the Apple Growers' Association at Hood River to its members. These included final returns on the 321,041 boxes of Spitzenberg apples handled during the season. The net average on these was \$1.61 a box.

THE Oregon Growers' Co-operative Association is seeking a reduction in transcontinental rates on late pears. At present all pears are classed as perishable and take a rate of \$2.08½ per hundred pounds. The association's contention is that late pears are no more perishable than apples and are entitled to the apple rate of \$1.50.

IT WAS recently announced that the John A. Eck company of Sutherlin had contracted for 50 carloads of green prunes to be shipped to its plant in that town. The firm expects to handle 65,000 boxes of green prunes from orchards about Sutherlin. The contract price was said to be two cents a pound, or one-half cent more than paid last season.

THE Salem Independent Broccoli Association recently held its annual meeting and election, selecting these officers: C. C. Russell, president; J. W. Savage, vice-president; Mrs. U. J. Lehman, secretary; Frank Hines, Fred Limbeck and M. C. Pettys, board of directors, together with Messrs. Russell and Savage. It was reported that Glafke

& Company, handling the association's crop, had taken 2000 crates. Nearly every grower will have an increased acreage this year. It was voted to obtain seed from England.

▲ ▲ ▲

FINAL returns on Hood River's apple crop of 1921, as published by the bureau of crop estimates, Department of Agriculture, show the total to have been 2,600,000 boxes, or considerably above all early government estimates. Expert orchardists of the district predict another big crop for this season.

▲ ▲ ▲

M. J. NEWHOUSE, general manager of the Washington Growers' Packing Corporation, on June 1 becomes assistant general manager of the Oregon Growers' Co-operative Association, succeeding C. I. Lewis. Mr. Newhouse is a graduate of Washington State College. He served for a time as county agent in Clarke county and then entered the packing corporation, which he helped organize.

▲ ▲ ▲

PLANs have been under discussion for construction of a cannery at Canby and it is believed the project will be put through in time to handle some fruits this season.

▲ ▲ ▲

ALTHOUGH the day was cold and uninviting it was estimated that 15,000 persons visited Salem on its annual blossom day, May 9. Hundreds of motorists from outside points viewed the orchards and enjoyed the exercises.

▲ ▲ ▲

L. S. AINSWORTH, who had been engaged in the apple shipping business at Hood River for two years, recently moved to Portland to engage in business.

▲ ▲ ▲

BLOSSOM DAY was observed at Hood River on May 21, after being set back one week because of a late spring. The committee in charge was composed of F. A. Cram, chairman, Dr. J. W. Sifton, Nelson Emory, E. E. Brett, C. A. Reid, K. W. Sinclair, Dr. L. L. Murphy, P. F. Clark, O. C. Hughes and Al Cruikshank.

▲ ▲ ▲

THE Brookhurst Orchard Company has been incorporated in Portland with a capital of \$75,000. The incorporators are Sam Morrow, Catherine Morrow and O. B. Morrow.

▲ ▲ ▲

WORK has been started at Salem on the new cannery of the Starr Fruit Company. The plant is to cost \$75,000 and is expected to be ready to operate this season. It will have a capacity exceeding 250,000 cases of fruit.

▲ ▲ ▲

F. C. FABER, formerly a merchant at Central Point, has purchased 20 acres of uncleared land at Willow Springs and has been having it cleared preparatory to setting out prunes and grapes.

▲ ▲ ▲

THE small prune orchard of H. C. Schultz at Dallas, 8½ acres in extent, was recently sold to A. A. Lapp for \$700 an acre. The tract, which is at the edge of the city, has no buildings on it.

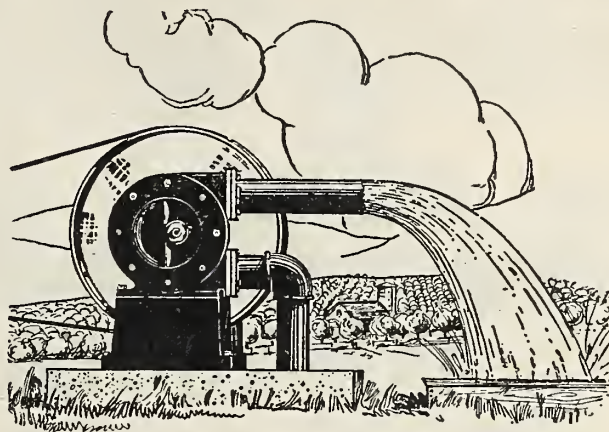
WASHINGTON

AT THE annual meeting of the Wenatchee Valley Traffic Association these trustees were elected: H. S. Crowl, C. T. Haskell, J. M. Wade, S. H. Andrews, D. L. Oliver and J. H. Auvil. Because the association has become self-supporting it was proposed to suspend the usual assessment of a quarter-cent per box. It was voted, however, to continue the assessment and extend activities of the organization.

▲ ▲ ▲

SUIT for \$100,000 has been filed at Wenatchee by W. F. Gwin against the Northwestern Fruit Exchange, J. S. Crutchfield, J. A. Meade and H. G. Fletcher. The complaint alleges se-

VIKING PUMPS



Keep Power Bills Down

Wherever water to be lifted stands within suction limit of the pump, the Viking will deliver it to any desired point more economically than any pump we know of.

The Viking converts over 60 per cent of the power applied into useful work. Some pumps use only 30 per cent; some use 40 per cent, but the Viking utilizes over 60 per cent on all average installations; in other words, it wastes less power.

The high efficiency of the Viking is due to the *Rotary Principle of Design*—every revolution of the Viking draws in a definite quantity of water, passes it through the pump and *forces* it out the discharge—no churning of water in pump casing—no unnecessary waste of power.

The Viking is a simple, slow speed pump, easy to install. No foot valve or priming pump required on low lifts. Built in the following sizes: 10, 20, 35, 90, 300, 450, 1050, gallons a minute.

Our Engineering Department will gladly recommend the correct size and type of pump to meet your requirements—no charge for this service.
Viking Pump Catalog Mailed Upon Request

De Laval Pacific Co.

SAN FRANCISCO



LABELS CARTONS

LITHOGRAPHED DISPLAYS

F.C. Stettler Mfg. Co.
 Portland, Oregon

MYERS

HONOR-BILT DOOR HANGERS



"MYERS MEANS MERIT"

CAN'T get off the track. They stay on—always. This, with patent adjustable feature make Myers Door Hangers absolutely superior. Roller bearings permit easy "push and pull." Twelve styles to fit every need. Myers dealers everywhere handle Myers Door Hangers and the world-famous line of Myers Pumps and Hay Tools. Be sure it's a Myers. See your dealer. Let him point out the Myers improvements. Or write us for catalog.

THE F. E. MYERS & BRO. CO.
 135 Church St., Ashland, Ohio

Pacific Northwest Distributors

Mitchell
LEWIS & STAVEN CO.

Spokane, Washington

Portland, Oregon

Buy From the Local Mitchell Dealer



Every atom of "Red Crown" mixes with air FOR POWER

"The gasoline of quality" is 100% POWER. It is refined to vaporize thoroughly. Every atom of it mixes in the carburetor with from 12 to 16 times its volume of air for POWER. With "Red Crown" you get ready starting—rapid acceleration—greater mileage—a continuous stream of power.

Run your car on "Red Crown" and *nothing else*, and you won't have to bother with carburetor adjustments. It is uniform in quality wherever and whenever you buy it.

Fill at the Red Crown sign—at Service Stations and garages and at other dealers.

STANDARD OIL COMPANY
(California)



NICE BRIGHT WESTERN PINE FRUIT BOXES AND CRATES

Good standard grades. Well made. Quick shipments. Carloads or less. Get our prices.

Western Pine Box Sales Co.
SPOKANE, WASH.

Catalog mailed on request.

FREE An 8x10 Enlargement

With \$3.00 Worth of
Kodak Finishing. Quick Service
Films received forenoon mailed out same
day. We pay return postage.
All Work Guaranteed
WOODARD, CLARKE & CO.
Alder at West Park PORTLAND, ORE.

rious injury to Gwin's reputation and business standing through publication of the recent suit of the defendants against the Skookum Packers' Association, Gwin and others.

WASHINGTON cranberry growers and various business interests have launched a campaign to increase the cranberry industry of Pacific county to an output of \$1,000,000 annually, or ten times the present production. Problems of disease control are being taken up under direction of Dr. F. D. Heald, pathologist of Washington State College, and J. R. Beck, county agent.

W. H. PRIDE & COMPANY of Bellingham, under a new policy adopted by the directors will dispose of some of the firm's farms and devote its time to the canning business. The tracts are to be sold with the stipulation that berries therefrom are to go to the firm for a period of ten years.

LOMBARD & HORSLEY are planting 20 acres to Rome Beauty apples on a tract between Zillah and Toppenish. They are spacing the trees 30 feet each way and are using no fillers. The firm now has 500 acres of orchard, having recently added plantings of 20 acres of Moorpack and Blenheim apricots and 40 acres of Elberta peaches.

AN OPTION has been taken on a site for the new warehouse at Meyers Falls proposed by the Fruit Growers' Warehouse company. The warehouse organization, now being incorporated, announces that stockholders who may not wish to pool their fruit may sell independently.

GOOD CROPS of strawberries are going out of the Underwood and White Salmon districts. The growers at Underwood are enabled to handle their crop better than heretofore, through use of the new cold storage plant they constructed at a cost of \$10,000.

AT THE annual meeting and banquet of the Fruit Growers' Association at Ticton the following officers were elected: J. W. Tapp, president; J. C. Havner, vice-president; F. J. Straka, secretary treasurer.

THE Edmonds Growers, Association elected officers for the year as follows: L. E. Keeton, president; George Addy, vice-president; J. J. Robinson, secretary; A. B. Lewis, treasurer.

THE Associated Growers' Exchange has taken over the business of Pennington & Co., at Yakima. Mark W. Pennington remains as general sales manager.

TWO of the 12 fruit warehouses of the defunct Spokane Fruit Growers' Company have been sold to private interests, according to Receiver J. A. MacMillan. The Otis Orchards building has been purchased by William Kroll and that at Meadow Lake by the Washington Grain & Milling Company, for use as a grain warehouse.

TOTAL fruit shipments of the past season from Wapato aggregated 983 cars. Potato shipments had amounted to 628 cars at the end of April, with about 450 cars still on hand.

EMPLOYEES of the Everett, Bellingham and Mount Vernon branches of the Pacific Fruit & produce Company enjoyed a reception and banquet recently, there being 40 persons present. R. B. McLaughlin, district manager, acted as toastmaster and the affair was in general charge of G. S. Grandberg, manager at Bellingham.

THE North Pacific Co-operative Berry Growers' Association is reported to have placed orders for \$25,000 worth of boxes with the Bremer Manufacturing Company at Puyallup.

Follow the Violet Lines. There is Merit in the Wrapper.

"CARO"
fruit
WRAPPERS



"Caro" Protects—"Caro" Prolongs the Life of Fruit—Why?

CHEMICALLY TREATED WITH BORDEAUX MIXTURE

FRUIT MATURITY is retarded by cold or refrigeration and hastened by heat or atmospheric exposure.

The soft fibrous silk-like texture of "Caro" provides just sufficient ventilation to retard the ripening process.

FRUIT DECOMPOSITION starts from a bruise which opens tiny holes and permits juice to escape and BACTERIA to enter. "Caro" clings closely and dries up the escaping juice. "Caro" ingredients harden the spot, destroy BACTERIA and FUNGUS SPORES and arrest decomposition.

United States Distributors, AMERICAN SALES AGENCIES CO., 112 Market Street, San Francisco, California.

SIMONS, SHUTTLEWORTH & CO., Liverpool and Manchester

SIMONS & CO., LTD., Glasgow

GARCIA, JACOBS & CO., London

SIMONS (Southampton) LIMITED, Southampton

Agencies and Representatives in Every Important European Market

European Receivers of American Fruits

*For Market Information Address*SIMONS, SHUTTLEWORTH & FRENCH CO.
204 Franklin Street, New YorkSIMONS FRUIT CO.
Toronto and MontrealSIMONS, SHUTTLEWORTH, WEBLING CO.
12 South Market Street, Boston

OUR SPECIALTIES ARE APPLES AND PEARS

OREGON PACKING COMPANY

Canners of

FRUITS AND VEGETABLES

Write or Wire Us for Cash Prices On All Varieties of Fruits

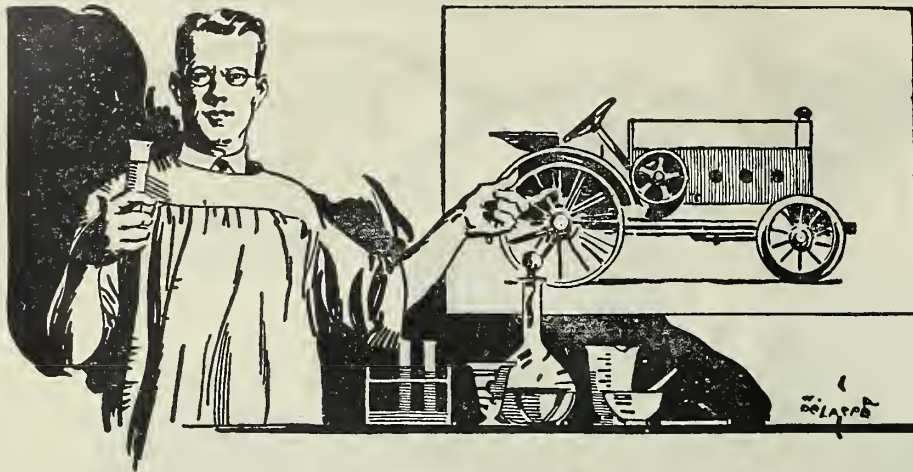
*Canneries located at*VANCOUVER, WASH.
LEWISTON, IDAHO.
SALEM, OREGON.*Main Office*E. 6th & ALDER STREETS,
PORTLAND, OREGON.

Clark County
Strawberries
Now
Ready

Gold Dollar, Marshall, Improved Oregon, Magoon
Clarke county growers have their own marketing agency.
We offer berries of standard grade, uniform pack and quality. Rigid inspection is maintained at receiving station.
Our central location and excellent transportation facilities enable us to give unusual service in filling orders.
All shipments are c. o. d. unless otherwise arranged.
Dealers will find our prices right, and our berries of highest quality. Wire us a trial order.

**WASHINGTON GROWERS' PACKING
CORPORATION**

507½ Main Street
Vancouver, Washington



A pure lubricating oil

"Zerolene oils are pure. The Standard Oil Company has always considered the removal of all detrimental properties and compounds as essential in making Zerolene."

— Board of Lubrication Engineers.

Zerolene in a good truck or tractor keeps your working equipment on the job—hour by hour—day after day—without a stop for the breakdowns of incorrect lubrication.

Because of its purity, Zerolene eliminates engine trouble. It gives perfect lubrication, and when it works into the combustion chamber, as any oil will do, it burns clean. Zerolene deposits a minimum of carbon, of a soft and flaky nature, most of which is blown out harmlessly with the exhaust.

Stability — Oiliness

The ideal motor oil, besides having purity, must be stable to resist engine heat. It must cling evenly to bearing surfaces, and must also flow freely and permit the development of maximum engine power and speed.

Zerolene is refined from crudes carefully selected for stability and oiliness, and our exclusive high vacuum refining process retains these qualities in their highest form.

Consult the Zerolene Correct Lubrication Chart for the correct grade for your tractor, truck or automobile.

STANDARD OIL COMPANY
(California)



more power & speed ~
less friction and wear ~
thru *Correct Lubrication*

WRITE
RIGHT
NOW!

For our Book "DEHYDRATION of FOOD PRODUCTS"
—It's Free. There is a best way to dry APPLES, PRUNES, etc.

Stephenson-Schaller Co.
ENGINEERS - MANUFACTURERS
SAN FRANCISCO.

We Build Best
Plants for
Dehydration of
Fruits and
Vegetables at
Low Cost

Address 312 Liberty Bank Building, San Francisco

M. E. HENDERSON of Bellingham has purchased the Blaine fruit cannery, which employs 25 persons and has been in operation only one season. He will move into larger quarters and plans to pack both fruits and vegetables.

CALIFORNIA

RATHER serious damage to strawberry plants around Florin by the root worm, sometimes called the strawberry leaf beetle, is reported by County Horticultural Commissioner A. E. Morrison.

▲ ▲ ▲

UNDER authorization of the Los Angeles county board of supervisors, four inspectors are making a survey to determine the extent in that county of eelworm infestation. A. L. Flinn, William C. Parsons and J. F. Moore have been assigned to this work, under direction of K. L. Wolff.

▲ ▲ ▲

HEAVY damage was sustained by pears in the Fruitridge and Camino sections, it has been reported, as result of a heavy fall of wet snow in April. Heavy breakage of limbs rather than cold inflicted the damage.

▲ ▲ ▲

C. E. SCOTT, graduate of Stanford University, and for two years a teacher in the San Mateo High School, has taken a position as assistant plant pathologist with the State Department of Agriculture.

▲ ▲ ▲

THE first box of cherries sent out the current season from Vacaville went forward to New York on April 27. It was handled by the California Fruit Distributors.

▲ ▲ ▲

THE FIRM of T. J. Poupart, Ltd., which handled more than 300 cars of northwestern apples last season, has entered the Redlands district for the purpose of handling oranges, soft fruits and apples. Sam P. Birch, whose headquarters are at Portland, Ore., recently visited the district to complete arrangements for representation there.

▲ ▲ ▲

OFFICERS for the year have been elected by the California Cherry Growers' Association as follows: F. W. Maddocks, president; A. B. Haslander, vice-president; C. Long, Jr., secretary. The annual meeting was held in San Francisco.

▲ ▲ ▲

SEVENTY acres in the Carpinteria Valley were this spring planted to Placentia walnuts. This acreage is on the Bailard ranch and smaller tracts were planted elsewhere.

▲ ▲ ▲

IT IS estimated by Horticultural Commissioner L. O. Haupt that between 30 and 40 cars of Tragedy plums will be shipped east as fresh fruit from Kings county this season. Last year such shipments amounted to 23 cars.

▲ ▲ ▲

THE University of California College of Agriculture is now offering a correspondence course in cherry raising, embracing twelve lessons.

▲ ▲ ▲

BUYERS are contracting a limited supply of dried pears of the 1922 crop in Sonoma county at 13 cents per pound, according to H. M. Winter.

▲ ▲ ▲

THE California Fruit Distributors of Sacramento have organized a sales agency for the handling of the 1922 deciduous fruit crop. The organization maintains thirty offices in larger cities of the country and is represented by 175 brokers in smaller markets.

▲ ▲ ▲

INCORPORATION of the Berryessa Pear Orchards Company, with headquarters in Oakland, has been effected and the company contemplates erection of a cannery.

▲ ▲ ▲

A. J. STURTEVANT, Jr., resigned April 1, as general sales and advertising manager of the California Peach and Fig Growers. He has been succeeded by E. S. Moorhead.

IDAHO

FROM JULY 1, 1921, to March 1, 1922, the Idaho inspection service of the State Department of Agriculture inspected 13,161 cars of fruits, vegetables and hay, produced last season. Of the total, 8,539 cars were potatoes, 3,055 apples, 1,475 prunes, 23 peaches, 11 cherries and 2 pears.

▲ ▲ ▲

ESTIMATES made at Twin Falls place shipments of Iceburg lettuce from the state this season at 500 cars. Last season there was a small acreage about Twin Falls which this year has been greatly expanded, in a general way including the potato-raising districts.

▲ ▲ ▲

D. B. WHELAN has been appointed entomologist of the University Extension Division, with headquarters in Boise. He succeeds Claude Wakeland, who has become the experiment station entomologist.

▲ ▲ ▲

STOCKHOLDERS of the Coeur d'Alene Canning Company have voted to increase the capital stock from 100,000 to 200,000 shares. Officers reported that eastern orders for fall delivery already include seven cars of apples and one and one-half cars of gooseberries, cherries and prunes.

Washington Growers' Corporation Notes

CLARKE COUNTY reports more or less damage done to strawberries by the weevil. A number of growers were compelled to plow up part of their acreage.

▲ ▲ ▲

FINAL payment to the members of the Washington Growers' Packing Corporation for their prunes was made a few days ago. Although the 1921 yield was light, the returns through the association were exceptionally good, in many instances averaging sixty dollars a ton more than that received by independent growers who sold their entire crop early in the season. The average paid the association members was eleven cents a pound and for the extremely large prunes sixteen cents a pound.

This remarkable record was due partly to the exceptionally fine pack of prunes which always brought top prices and partly to the low overhead which almost set a new record.

▲ ▲ ▲

A COMPLETE clean-up of the 1921 crop prunes is reported from association offices in Clarke county. For this reason a brisk demand for new crop prunes is expected in the fall.

▲ ▲ ▲

FOUR tons of dried prunes to the car are reported by the Association from the orchard of Abel Johnson located in Fruit Valley, about a mile north of the city limits of Vancouver. For these prunes Mr. Johnson received between \$180 and \$200 a ton. An orchard belonging to John Spurgeon in the same locality produced well over three tons of dried prunes to the acre.

▲ ▲ ▲

THE potato department of the packing corporation in Clarke county reports its 1921 stocks all cleaned up. Fifty carloads of seed potatoes were shipped to California points. Certified seed brought an average of well over \$3 a hundred pounds, and was in strong demand. J. E. Larson, manager of the potato department, has tendered his resignation, to become effective soon. Mr. Larson will enter business for himself. His knowledge and untiring efforts in behalf of the potato industry of Clarke county have been much appreciated.

Purity



Air, dust, dirt and all that goes with them—these are the enemies of chocolate purity. And these are locked out of Ghirardelli's by "locking" the chocolate in the tin. It is the tin that enables Ghirardelli's Ground Chocolate to reach your table as pure, clean and flavor-fresh as the hour it leaves our factory. Ask for Ghirardelli's at the store where you trade and send for recipe booklet.

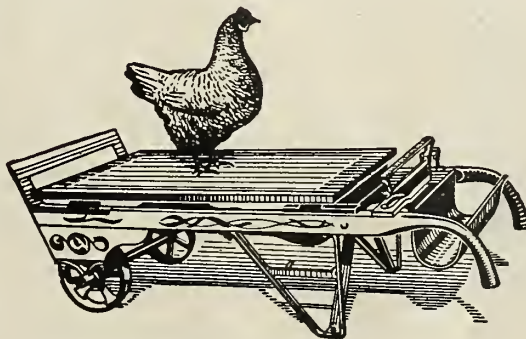
Say "Gear-ar-delly"

Since 1852 D. GHIRARDELLI CO. San Francisco

GHIRARDELLI'S

Ground CHOCOLATE

THE JUNE DROP



Weighs accurately from 1 pound to 1 ton

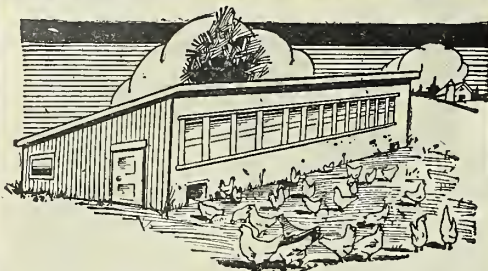
THE RENFREW TRUCK SCALE price drops. The RENFREW will weigh anything and can be wheeled anywhere like a hand truck.

The ANKER-HOLTH CREAM SEPARATOR also reduced in price again. Now is the time to buy for there is no indication of any further drop.

No better machine made than the ANKER-HOLTH, the separator with the SELF-BALANCING BOWL.

The PERFECTION MILKING MACHINE also takes a drop and the PERFECTION you know takes the lead.

The J. C. Robinson Company
49 First Street, Portland, Oregon



SASH AND DOORS

O. B. Williams Co.

1943 First Avenue South, Seattle

Chicken House Sash

20 in. wide by 25 in. high, 80c
A dozen different sizes in stock for immediate shipment

Sky Lights for Chicken Houses

36 in. by 40 in.; price glazed, \$2.00
This is the size recommended by the Western Washington Experiment Station—we carry them in stock for immediate shipment. Sash and Doors for all purposes at lowest prices. All orders receive prompt attention. Our large illustrated catalogue No. 19, showing full line of building material and built-in fixtures for the home, free on request.

O. B. Williams Co.

Established 1899

Arrow Carbolineum

(Formerly Avenarius Carbolineum)

Protects poultry against vermin—
Preserves wood against decay. When you buy Carbolineum be sure you get Carbolineum and not something called just as good. Write for prices and circulars.

CARBOLINEUM WOOD PRESERVING COMPANY

222 E. Water St. Portland, Oregon

The ARCADY Company
Advertising

Anyone whose business involves personal salesmanship can profitably use the right kind of advertising literature. Did you ever stop to think, for instance, that the printed page can call on your trade at about 2 per cent of the cost of personal selling.

Why not let one of our representatives tell you more about printed salesmanship.

Arcady Building • 12th & Jefferson Sts., Portland, Oregon

Also PRINTING
MULTIGRAPHING
ADDRESSING
MAILING
MAILING LISTS

MAIN
8829

THIS PUBLICATION IS A PRODUCT OF OUR PRINTING DEPARTMENT

With the Poultry

STIMULANTS FOR HENS

A FLOCK of laying hens in good health has no need for condiments, say poultrymen of the United States Department of Agriculture. A hen whose digestive apparatus is in good working order needs no more stimulation for egg production than is provided by a good, well balanced ration, proper care and housing. But when hens are off their feed and look dumpish a little jigger of pepper or something of the sort in the ration may cause them to pick up and run on all cylinders again.

Various snappy and pungent condiments are used for the purpose, but the following mixture has been found as good as any and may be made up by the flock owner at low cost: Mix equal parts of ground red pepper, ground allspice, ground ginger and ground cloves, and one-half part of ground fenugreek seed. Many of the condiments sold to flock owners are largely filler and sell for a high price. In the mixture given there is nothing but essentials. A tablespoonful of the mixture in 2 quarts of moist mash 2 or 3 times a week or a teaspoonful in 1 quart daily should be fed until the birds are back in good order.

It is not good practice for poultrymen to feed these things when the flock is in good appetite. When feed attracts hens little more can be done to stimulate the egg organs.

▲ ▲ ▲

REMEDY FOR TOE PICKING

TO CHECK and prevent toe-picking, one authority suggests, first of all, the use of salt. Dissolve one teaspoonful of salt in one quart of water. Place this where it is accessible to the chicks for one-half hour each morning for four days. This will be long enough for them to drink and still not long enough for them to take more than is good for them, which will cause inflammation. It takes about four days to cure chicks of this habit.

It is also well to use a tablespoonful of epsom salts in the drinking water once a week. This acts differently from ordinary salt and is in some respects a food for poultry. A direct sunlight shining on the toes makes them appear like attractive worms. To avoid this place an opaque covering over the windows to diffuse the sunlight. Then provide a litter of straw so that they will be kept busy. This also will hide the toes to some extent.

Do not keep the brooder house too warm. It is safer to keep the brooder house as cool as possible and at the same time keep it warm enough so that the chicks will not crowd. Provide a plentiful supply of fresh air at all times, both day and night. Let the chicks out in runs and on the ground as soon as possible. It is usually safe to do this, weather permitting, when the chicks are a week old.

▲ ▲ ▲

THAT CRITICAL PERIOD

INASMUCH as the first three weeks of the chicken's life is the critical and uncertain period, this is the time it needs the most careful attention. If any of your chicks show leg-weakness, give plenty of exercise and get them out of doors in the middle of the day at least. They will be all right after ten days.

Watch the chicks and do not let them huddle in a corner until chilled. At this stage of their lives they lack chicken sense and must be taught needed lessons.

Sometimes a curtain over the window to keep out the direct warm sun rays will help teach them to seek the warmth of the hover when needed.

You must have purebred stock and perfect conditions for brooding, but if the food is not right in

quality and quantity, your labor is lost. Bear in mind that warmth, cleanliness and fresh, clean drinking water are all necessary in starting little chicks on the right road.

▲ ▲ ▲

NOVEL INCENTIVE FOR HENS

IT HAS remained for a California man to devise the most unusual method of encouraging hens to lay. John C. Hayes of Alameda county has reported success with a novel experiment. During his spare time, Mr. Hayes, who looks after a beautiful suburban place near Burbank, claims to have discovered a method which has increased the egg production of his poultry yard 40 percent.

Hayes acted upon the psychology that one hen seeing another in the act of laying an egg would do her best to emulate the act of her prolific sister. He therefore secured a dead hen, had it mounted in a laying position by a taxidermist and placed it in one of the nests in his hen house. The results, Hayes said, were marvelous.

▲ ▲ ▲

IF THE growing fowls are troubled with leg weakness, give them a mixture of bran, cut clover hay, linseed meal and cut green bone and meat. A little slaked lime in the drinking water may also help.

Statement of Ownership

STATEMENT of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of the Better Fruit, published monthly at Portland, Oregon, for April 1, 1922.

State of Oregon, County of Multnomah—Before me, a notary public in and for the state and county aforesaid, personally appeared C. J. Owen, who, having been duly sworn according to law, deposes and says that he is the business manager of Better Fruit, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, postal laws and regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor and business managers are:

Publisher, Better Fruit Publishing Company, Inc., 281 12th St., Portland, Oregon. Editor, Ernest C. Potts, 902 E. 27th St. N., Portland, Oregon. Managing Editor, Jerrold Owen, 281 12th St., Portland, Oregon. Business Manager, C. J. Owen, 281 12th St., Portland, Oregon.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock).

Owner, Better Fruit Publishing Company, Inc., Portland, Oregon. Stockholders, Jerrold Owen, 281 12th St., Portland, Oregon; D. L. Carpenter, 800 Oregonian Bldg., Portland, Oregon; E. E. Faville, 800 Oregonian Bldg., Portland, Oregon; A. W. Stypes, 800 Oregonian Bldg., Portland, Oregon.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of the total amount of bonds, mortgages or other securities are: (If there are none, so state). None.

4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also in cases where the stockholders or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner, and this affiant has no reason to believe that any other person, association or corporation has any interest, direct or indirect, in the said stock, bonds or other securities than as so stated by him.

C. J. OWEN,
Business Manager.

Sworn to and subscribed before me this first day of April, 1922.

(SEAL)

GEORGE H. CARR,

Notary Public for Oregon.

(My commission expires April 29, 1925.)

Marketing News of Interest

SEVERAL markets, including that of New York, report that fancy apples are scarce. Supplies continue quite moderate and are varied as to quality and condition. Some received in New York show signs of scald and the effects of holding.

The demand for fancy large northwestern boxed apples has continued good in New York, with prices tending upward. The third week in May Newtown Pippins and Winesaps brought \$2.00 to \$5.25, and Bens, \$2.00 to \$4.00. California fancy yellow Newtowns of small size sold generally at \$2.60 to \$2.65; fancy large Spitzenbergs brought \$3.25 to \$3.75 and medium to small marks \$2.50 to \$3.00 per box.

▲ ▲ ▲

ROUNDING out its needs of 2,000 cars of boxed apples to fill its line of fruits and vegetables, the Associated Fruit Company of Chicago, general distributors, expects to contract 500 cars in the Spokane valley, according to S. H. Boddinhouse, sales manager, who has been in the district meeting growers. The company recently purchased the warehouse and boarding house of the defunct Spokane Growers' Company at Otis Orchards and the warehouse at Park's Spur.

▲ ▲ ▲

THE peach crop of Texas will be almost a total loss as a result of the peculiar after effect of the freeze of March 1, according to information being gathered by entomologists of the state. The loss became apparent only two weeks ago and indications are that in many places where peaches are an important money crop and where many carloads are shipped annually, the yield will hardly be sufficient to harvest.

▲ ▲ ▲

WORK tending toward establishment of the headquarters of the Northwestern Fruit Exporters, Inc., is going ahead rapidly at Seattle, and the organization will be working long before time for the season's business to begin. Branches are planned for Hood River, Yakima, Wenatchee, London and Portland, Ore., and the London office will be kept open the entire year. The incorporators are H. F. Davidson of Hood River; Edwin Smith of Wenatchee, and J. MacPhee Ferguson of Yakima. The individual members will continue their operations independently, but will combine when it comes to the export trade.

▲ ▲ ▲

L. F. HENDERSON, pioneer pear grower of Hood River says that in all of his experience here he had never seen pear blossoms heavier than this season. He declares that the crop will be a record one if only one of every ten pears set.

▲ ▲ ▲

PRUNE sales in early May on the New York market brought firm and rising quotations. California packers were quoting 25 cents for 20s, with smaller grades in proportion, f. o. b. San Francisco.

Bulletin for Poultrymen

"Suggestive Points on Hatching and Feeding Chicks" is the title of a new circular by H. E. Cosby, just issued by the extension service of the Oregon Agricultural College. Mr. Cosby is extension specialist in poultry husbandry. Subjects explained include selection and care of eggs for incubation, operation of the incubator, brooder preparation, chief causes of chick losses, feeding principles, and a tentative feeding schedule.

Beekeeping Commercialized

By A. SWAHN

THE TIME is coming, and not in the distant future either, when beekeepers must put the honey industry on a business basis the same as all other successful business enterprises. In other words, it must be commercialized.

In the honey industry, like any other business, we cannot expect the best results without trained brains, without work and without proper investment. We cannot expect to meet competition by sitting around pitying ourselves, and bemoaning the fact that the big fellows in the business are making money. Why do they make money? Simply because they put both money and brains behind their business.

The old adage, "The pen is mightier than the sword," might be modernized and brought to date by a new adage, "The pencil is mightier than the plow." This means that if we use our brains and a pencil, as well as the necessary capital, we will find means by which we can eliminate the hard work of holding the old plow, and pounding old Dobbin on the back.

Do like the big fellows in other industries. Systematize your work.

The secret of successful beekeeping is intelligent management, co-operation and maintaining fair prices. The very men who kill prices are the ones who do the most kicking about the high cost of supplies and the low price of honey.

Every time you feel that some one should be kicked, ask some of your kind and obliging friends to kick you first, and the chances are that the right party will receive the kick.

Think more about your own faults and shortcomings, and less about the faults of others, and the present dark cloud will soon turn toward you its silver lining.

We have enough beekeepers, but not enough bees. We will now consider the point around which the success of the whole industry turns, viz: The cost of production. There are three ways to increase the profits of any business:

First—Better prices without increase in cost of production.

Second—Decrease in cost of production without a corresponding decrease in selling price.

Third—Increase in the turnover. Applied to beekeeping this means more honey without an increased operating expense.

A great many beekeepers have the wrong idea in thinking that the only way to make more money is to get higher prices. We should consider the cost of production a great deal more than the selling price. It is the cost of doing business that ruins so many business men. While it is true that the local prices are often established by the smaller beekeepers, it is also true that the wholesale or quantity prices are established by the real commercial beekeepers who keep a large number of colonies.

We who have only 75 to 100 colonies, must not think we are commercial beekeepers in the true sense of the word, and unless we have some other source of revenue will not get to first base in a profit comparison with some of the large beekeepers who keep from 500 to several thousand colonies. They can sell at a profit for less than it costs us to produce.

We must do one of three things. Do less work with our present number of colonies, and more in some other line of business, or keep more bees with better working methods, or stop kicking because the other fellow can undersell us at a profit.

Commercial beekeeping means business beekeeping where cost is considered more than selling price. In other lines of business the selling price is usually established by keen competition, and success depends mainly on the cost of doing business. The same rule must be applied to the honey industry in order to make it a greater success.



FOR FARMERS WHO GROW FRUIT

Every farmer with an apple or peach orchard will find much of interest in each issue of this live monthly bulletin. Published to promote better practice in handling fruit crops. Subscription price one dollar a year. Mailed FREE to any large fruit packer or grower.

Skinner Packing House News

Dunedin Third St. Florida

B E E S The Diamond Match Company

APIARY DEPARTMENT
Manufacturers of Bee Keepers' Supplies

Chico, California, U. S. A.
(The largest bee hive factory in the world)

Write for catalog and discount sheet; and, if a beginner, for Cottage Bee-Keeping, also for particulars of the MacDonald Aluminum Combs.

Complete line of QUALITY BEE SUPPLIES AT REDUCED PRICES

Immediate Service
Every pound of SUPERIOR foundation used on your bees virtually saves from 10 to 15 lbs. of honey.

Write us and we will explain.

Superior Honey Co.
Ogden, Utah



DEPT. B.

Rubber Stamps for Fruit Boxes

Write for Sample and Prices to

ROGERS COMPANY

Gerlinger Bldg. PORTLAND, ORE.

Classified Advertisements

RATES, 4 CENTS PER WORD

NURSERY STOCK

BLACKBERRY PLANTS—Cory's Thornless. Requires less sugar in cooking than any other. Macatawa—Raspberries. Alton Improved—Ranere—Blackcaps—Loganberry—Rhubarb roots. Jno. Lammiman, Rt. 1, Palo Alto.

PLANT—The new Red Gravenstein apple. Thoroughly proven for the coast. Better than the old Gravenstein. Its bright red color increases market value. Write for information. WASHINGTON NURSERY CO., Toppenish, Wash.

BEEES

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled. "Everything in Bee Supplies." Superior Honey Co., Ogden, Utah.

FOR SALE—Gentle, Prolific Italian Queen Bees. Let the bees pollenate your blossoms and store honey for you. Directions for introducing with each shipment. Circular free. J. D. Harrah, Freewater, Oregon.

POULTRY

S. C. BUFF LEGHORNS—Just won fifth cockerel, Chicago Coliseum. Cockerels and eggs. M. H. Mann, Wood Cross, Utah.

500,000 WHITE LEGHORN Baby Chicks—Bred for eggs, vigor, size. Safe arrival in good condition guaranteed. Free catalog and book on "Raising the Chicks." Oak Heights Poultry Farm, Route 3, Box 67B, Tacoma, Wash.

REAL ESTATE

CUT-OVER and Developed Lands, 15 to 25 miles N. E. Spokane; extra good soil; spring brooks; grows grain, vegetables, hay, fruits; several developed ranches; few stock ranches; \$10 to \$20 acre; 10 years' time, 6 per cent interest. Free lumber. Write owners for free book. Edwards & Bradford Lumber Co., Elk, Wash.

WANTED—To hear from owner of good ranch for sale. State cash price, full particulars. D. F. Bush, Minneapolis, Minn.

MISCELLANEOUS

EASTERN WHITE OAK KEGS—1 gal. plain, \$1.40; charred, \$1.60; 2 gal. plain, \$1.60 charred, \$1.80; 3 gal. plain, \$1.90; charred, \$2.10; 5 gal. plain, \$2.50; charred, \$3.00; 10 gal. plain, \$3.50; charred, \$4.00. Sent by express anywhere—Check must accompany order—Packed in boxes if desired. Write for wholesale prices. Panama Cooperage Co. Front & Salmon, Portland, Oregon

TRACTOR BARGAINS—Cletrac "W," only demonstrated, \$1250; Cletrac "W" rebuilt, good as new, \$1000; Cleveland model "H," never used, \$1100; Cleveland "H," slightly used, snap at \$750; Oldsmar Garden Tractor demonstrator, \$390. O. V. Badley, 425 E. Morrison, St., Portland, Oregon.

BEFORE BUYING—Have an experienced horticulturist examine your orchard for you. I saved one man \$5,000 on a \$14,000 deal. Special attention given to orchards of non-resident owners. Private demonstrations and consultations given. Luke Powell, Yakima, Wash., consulting horticulturist. (I do not sell real estate.)

OLD FASHIONED TENNESSEE RED LEAF tobacco, 10 lbs., No. 1, \$3.50; 10 lbs., No. 2, \$3; 10 lbs., Old Kentucky Burley, \$5. All prepaid; satisfaction or money back. Jim Foy, Dukedom, Tennessee. Reference, Dukedom bank.

TRY OUR EARLIEST OF ALL, or Six Weeks potatoes. Also our Wonderful Hardy Hybrid Alfalfa. J. L. Lawson,—Reliable Seed and Nurseryman, San Jose, California.

TOBACCO—Natural leaf chewing and smoking. Rich ripe two year old. 5 lbs. \$1.75; 10 lbs. \$3. Sample, 20 cents. Maddox Bros., Dept. 30, Mayfield, Ky.



Preserving time— and a cool kitchen

Make canning time a real pleasure this year by using a good oil cook-stove. It concentrates a steady, controlled heat directly under the utensil. Your task is shortened and your kitchen is kept cool, clean and comfortable.

To insure best results, use only Pearl Oil—the clean-burning, uniform kerosene—refined and re-refined by a special process.

Sold by dealers everywhere. Order by name—Pearl Oil.

STANDARD OIL COMPANY
(California)

PEARL OIL
(KEROSENE)
**HEAT
AND LIGHT**



STANDARD
OIL
COMPANY
(California)

HOMESPUN CHEWING OR SMOKING TOBACCO—5 lbs., \$1.25; 10 lbs., \$2.50; 20 lbs., \$4.50. Farmers Union, Mayfield, Ky.

TILlicum—A fluid grafting and covering wax; no heating required, \$1.25 a quart prepaid. Paul Kruger, Watsonville, California.

SALESMEN WANTED

MEN with proven ability capable of selling a line of high grade nursery stock on a commission contract. Weekly cash advance. Splendid territory may be had by answering immediately. SALEM NURSERY CO.

427 Oregon Building Salem, Oregon

POSITIONS

WANTED—Men, Boys over 17. Become Railway Mail Clerks. Commence \$133 month. Common education sufficient. List positions free. Write immediately. Franklin Institute, Dept. E105, Rochester, N. Y.

LET US HANDLE

your Apples, Pears, Peaches, Potatoes, and all kinds of Fruit and Produce.

Cash or Consignment

Write us what you have to offer. We give prompt service.

PORTLAND PRODUCE DISTRIBUTORS

215-217 Washington St.
Portland, Oregon

long-life

a built-in quality of

Finest qualities of steel and extremely exacting standards of manufacture contribute to the rugged strength and unmatched endurance of "Caterpillar" T-35 Tractor.

Highest grade materials are used—nickel steel, chrome nickel steel, chrome vanadium steel, saw steel—there is not a carbon steel gear or shaft in the entire tractor. All bearings—except, of course, in the motor—are anti-friction: ball, roller or tapered roller. Perfect lubrication and complete enclosure from dust and dirt further insure long life.

Many of the first "Caterpillar" Tractors built are still doing daily duty. Model T-35 possesses, in a highly developed degree, the same qualities that have made that record possible. That means that it will do your work dependably and economically. A Pacific Coast factory and service organization mean that you get real service—quickly. Write at once for complete catalog.

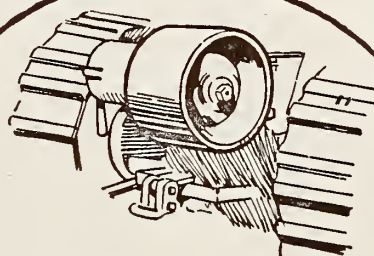
THE HOLT MANUFACTURING CO.

Spokane, Wash.

Factories at Stockton, Calif., and Peoria, Ill.
Oregon Representative, J. W. Hill, Henry Bldg.
Portland

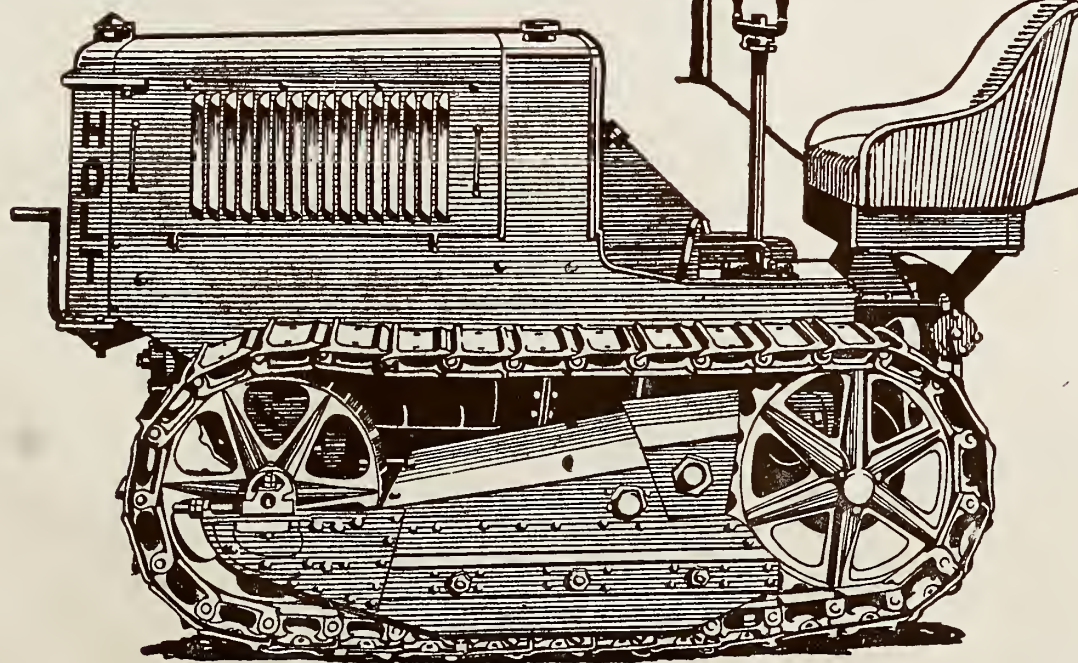
CATERPILLAR

T-35 tractor



For Belt Jobs

The belt pulley unit gives the T-35 Tractor a vast field of usefulness for stationary work in addition to the innumerable tractive jobs it will handle. With it you can pump, grind, saw and do other belt jobs easily and quickly. The belt pulley operates at 3,000 feet per minute belt speed.



There's
only one
Caterpillar
Holt
builds it

The World Our Orchard

“Throw Medicines to the Dogs.”

(Shakespeare)

EAT APPLES

Don't look at the Brands—all apples are good, some are better. Brands don't mean anything.

Whether packed in boxes or barrels or drygoods cases does not make them any the less healthy. Apples are nature's remedy and most efficient tonic.

Apples, like bread, are the UNIVERSAL FOOD.

Apples at breakfast are nature's physic.

Apples at luncheon are nature's tonic.

Apples at dinner are better than any medicine for your digestive organs.

Apples immediately before retiring are nature's greatest and best dentifrice.

This advertisement is the first of a series of short and trenchant articles which we will publish from time to time, with the object of increasing the consumption of apples regardless of Brands or where they were raised. We believe this the only sane method of putting before the consuming public the real value of all apples, and increasing the sales thereof.

Our Market, The World

Steinhardt & Kelly

273-277 Washington Street

NEW YORK

102-106 Warren Street

Cordoba 2260 Buenos Aires
ARGENTINE

Rua de Rosario 102 Rio de Janeiro
BRAZIL

FIELD OFFICES:

Rocky Ford, Colo.
Phoenix, Ariz.
Las Cruces, N. Mex.

Carlsbad, Cal.
Brawley, Cal.
Tampa, Fla.

Laredo, Tex.
Clearwater, Fla.
Calipatria, Cal.

Yakima, Wash.
Wenatchee, Wash.



